

# ŠOLSKI CENTER ŠENTJUR

MEDNARODNA KONFERENCA  
**SODOBNI IZZIVI  
V PREHRANSKI VERIGI**

ZBORNİK IZVLEČKOV

INTERNATIONAL CONFERENCE  
**CONTEMPORARY CHALLENGES  
IN THE FOOD SUPPLY CHAIN**

BOOK OF ABSTRACTS



Šentjur, 26. in 27. januar 2022



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Kataložni zapis o publikaciji (CIP) pripravili v Narodni in  
univerzitetni knjižnici v Ljubljani

**COBISS.SI-ID 101343747**

ISBN 978-961-6622-28-8 (PDF)

**Urednica:** dr. Katja Gobec

**Naslov:** Sodobni izzivi v prehranski verigi

**Organizacijski odbor**

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Jurij Gunzek

Jerneja Planinšek Žlof

dr. Katja Gobec

**Oblikovanje**

Darinka Bosnar

**Založnik:** Šolski center Šentjur

**Elektronska izdaja**

[https://sc-s.si/joomla/images/Zbornik\\_izvle%C4%8Dkov\\_SODOBNI\\_IZZIVI\\_V\\_PREHRANSKI\\_VERIGI.pdf](https://sc-s.si/joomla/images/Zbornik_izvle%C4%8Dkov_SODOBNI_IZZIVI_V_PREHRANSKI_VERIGI.pdf)

**Leto:** 2022

Za strokovno vsebino in jezikovno pravilnost odgovarjajo avtorji.



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*Vabljeni predavanje/Invited lecture*

## **NASTANITEV IN PREHRANA KOKOŠI NESNIC ZA SAMOOSKRBO NA KMETIJI**

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### **IZVLEČEK**

Potrošniki v zadnjem času čedalje bolj posegajo po lokalno pridelani hrani iz manjših, družinskih kmetij. Vse bolj jih zanima reja živali v pogojih, kjer se le-te dobro počutijo ter način oz. tehnologija reje. Manjši rejci običajno nimajo registriranih rej, kokoši nesnice redijo za samooskrbo z jajci ali jajca prodajajo direktno končnemu porabniku na mestu priraje ali lokalnih tržnicah. Takšne reje, običajno kot dopolnilna dejavnost na kmetiji, so zelo pomembne za ohranjanje kmetijske krajine, saj imajo kokoši v teh rejah večinoma možnost izpusta v obliki zimskega vrta ali prostega izpusta na travne površine. Pri reji kokoši nesnic je zelo pomembna tudi prehrana. Živali morajo imeti vse življenje zagotovljeno celotno paleto različnih hranil, da lahko dosežajo dobre proizvodne rezultate. S staranjem, rastjo in načinom reje se njihove prehranske potrebe spreminjajo. Pri reji, kjer so kokoši tudi na paši, ne moremo doseči takšne natančnosti pri sestavi popolne krmne mešanice, je pa pomembno, da živalim zagotovimo vse potrebne hranljive snovi in tudi svežo pitno vodo. V prispevku bomo predstavili možne sisteme reje manjših jat kokoši nesnic, podali nekaj smernic za krmljenje kokoši nesnic in predlogov za sestavo krmnih mešanic.

**Ključne besede:** nesnice, samooskrba, nastanitev, prehrana.

# **HOUSING SYSTEM AND NUTRITION OF LAYING HENS FOR SELF-SUFFICIENCY ON THE FARM**

## **ABSTRACT**

In recent years, consumers have become more interested in buying locally produced food from smaller family farms. They are also increasingly interested in animal welfare and the production system that provide such demand. Small family farms usually do not have registered flocks, the chickens are raised for self-sufficiency or the eggs are sold directly to the end consumer on the farm or at a local market. This type of breeding, usually as a complementary activity on the farm, is very important for the preservation of the agricultural landscape, as the chickens on these farms usually have the possibility to be released on grassland in the form of a winter garden or free range. In poultry farming, the nutrition of the birds is also very important. They need to be fed a whole range of different nutrients throughout their lives to achieve good production results. Their nutrient requirements change with age, growth and the type of production system. In production systems where the birds are also kept on pasture, we cannot be as specific about the composition of the complete feed mixture, but it is important to provide the birds with all the nutrients they need and fresh drinking water. In this article we present possible production systems for small flocks of laying hens, some guidelines for feeding laying hens and some suggestions for the composition of feed mixtures.

**Keywords:** laying hen, self-sufficiency, housing, feeding.

*Vabljeno predavanje/Invited lecture*

**VPLIV BIOSTIMULANTOV NA KOLIČINO IN  
KAKOVOST PRIDELKA JABLANE (*Malus domestica*  
Borkh.) SORTE 'IDARED' PO POZEBI**

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**IZVLEČEK**

Od leta 2016 do leta 2021 so slovenski sadjarji kar 5 krat utrpeli veliko gospodarsko škodo zaradi spomladanskih nizkih temperatur. Da bi zmanjšali škodo ob pozebi, se sadjarji poslužujejo različnih metod zaščite nasada pred nizkimi temperaturami. Ena izmed metod je tudi uporaba biostimulantov. V raziskavi smo želeli ugotoviti vpliv biostimulantov na osnovi aminokislin in morskih alg ter giberelinov na količino in kakovost plodov jablanove sorte 'Idared'. V poskus smo vključili dve obravnavanji: biostimulanti in kontrolo, kjer dreves nismo tretirali z biostimulanti in giberelini. Pri obravnavanju biostimulanti smo pred nastopom nizkih temperatur drevesa tretirali s pripravkom na osnovi morskih alg in zraven dodali foliarno gnojilo (fosfor in kalij), takoj po pozebi pa smo dodali aminokislino, ekstrakt morskih alg in gibereline. Ugotovili smo, da je uporaba biostimulantov značilno vplivala na večje število plodov/drevo, večji koeficient rodnosti, pridelek/drevo in na hektar ter večji delež pridelka I. kakovostnega razreda. Plodovi dreves, ki so bila tretirana z biostimulanti, so bili višji, širši in so imeli večjo maso ploda. Z uporabo biostimulantov lahko ublažimo negativne posledice nizkih temperatur, jih pa pri temperaturi -8 °C ne moremo popolnoma preprečiti.

**Ključne besede:** sadjarstvo, jablana, *Malus domestica*, pozeba, pridelek, biostimulanti.

# INFLUENCE OF BIOSTIMULANTS ON THE QUANTITY AND QUALITY OF APPLE (*Malus domestica* Borkh.) CULTIVAR 'IDARED' AFTER THE FROST

## ABSTRACT

From 2016 to 2021, Slovenian fruit growers suffered significant economic loss 5 times due to low spring temperatures. In order to reduce the damage caused by frost, fruit growers use various methods to protect against low temperatures. One of these methods is also the use of biostimulants. In this study, we aimed to determine the influence of biostimulants based on amino acids and seaweed and gibberellins on the quantity and quality of apple cultivar 'Idared'. The experiment included two treatments: biostimulants and control in which trees were not treated with biostimulants and gibberellins. In the biostimulant treatment, the trees were treated with a seaweed-based biostimulant and foliar fertilizer (phosphorus and potassium) before the onset of low temperatures, and amino acids, seaweed extract, and gibberellin were added immediately after frost. We found that the application of biostimulants significantly affected the higher number of fruits/tree, higher yield coefficient, higher yield/tree and per hectare, and higher percentage of I. quality class. Fruits from trees treated with biostimulants were larger, wider and had higher fruit weight. By using biostimulants, we can mitigate the negative effects of low temperatures, however damage can not be completely prevented at a temperature of -8 °C.

**Keywords:** fruit growing, apple, *Malus domestica*, frost, yield, biostimulants.

# POTENTIALE DER MUTTERGEBUNDENEN KÄLBERAUFZUCHT

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## ZUSAMMENFASSUNG

Seit dem Neubau des Rinderstalls in der LFS Grottenhof in Graz, Österreich im Jahr 2018 wird eine neue Form der Kälberaufzucht getestet, die mutter- oder ammengebundene Kälberaufzucht. Es soll folgenden Fragen nachgegangen werden. Wie kann der Kontakt von Kuh und Kalb unter modernen Haltungsbedingungen ermöglicht werden und bringt dies Vorteile für Tiere und Landwirte. Dabei soll untersucht werden, wie sich diese Form der Aufzucht auf die Gesundheit der Kälber, die Leistungsfähigkeit der Kühe, und den Arbeitszeitbedarf auswirkt. Ähnliche Versuche werden im Moment auch an der ETH Zürich, der VetmedUni Wien, der Universität Kassel und der CAU Kiel durchgeführt.

**Keywords:** Kälberaufzucht, Ammen, muttergebunden, Kuh-Kalb, kuhgebunden

# **POTENTIAL OF MOTHER-RELATED CALF BREEDING**

## **ABSTRACT**

Since the new construction of the cattle barn in the LFS Grottenhof in Graz, Austria in 2018, a new form of calf rearing has been tested, mother-bound calf rearing. The following questions should be investigated. How can contact between cow and calf be made possible under modern housing conditions and does this bring advantages for animals and farmers. The aim is to investigate how this form of rearing affects the health of the calves, the productivity of the cows and the need for working hours. Similar experiments are currently being carried out at the ETH Zurich, the Vetmed-University Vienna, the University of Kassel and the CAU Kiel.

**Keywords:** Calf rearing, mother-bound, cow-calf, cow-bound



# HOW CAN WE MANAGE SOOTY MOULD IN ORGANIC AND IN INTEGRATED PRODUCTION OF APPLE?

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## **ABSTRACT**

In organic apple cultivation and recently also in IP production in South Tyrol (Italy) the losses caused by epiphytic fungi have increased considerably. Affected are mainly late-ripening varieties, varieties that are only extensively managed, and orchards in humid locations. The damage pattern on the fruit is shown by dark spots on the skin. They resemble sooty blotch and can also be wiped off. The spots are not always visible at harvest. However, in long-term storage, especially with high humidity, the spots rapidly increase, making it difficult for the market to accept them. Various fungi are isolated on the fruits, but it is not clear which fungi are responsible for the damage. At the Research Centre Laimburg (RCL), field trials with plant protection products and with rain cover (Keep in Touch®, antiacqua system) have been conducted since 2002. In addition, tests were carried out before and after storage with various preparations, with hot water, and with brushes. Brushing after storage has proven to be the best method, but Gloeosporium infestation increases slightly due to brushing

**Key words:** organic apple production, sooty mould, sooty blotch, rain covers, brushes



# **WICHTIGE ERKENNTNISSE DER PÄTFROSTBEKÄMPFUNGSVERSUCHE DER VERSUCHSSTATION OBST- UND WEINBAU HAIDEGG UND SCHLUSSFOLGERUNGEN FÜR DIE ZUKUNFT**

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## **AUSZUG**

Seit dem Jahr 2016 gab es im Obstanbau in der Steiermark fünf Jahre mit Schäden durch Spätfröste; nur im Jahr 2018 gab es gute Erträge im Obstbau. Der Klimawandel hat für die Obstwirtschaft der Steiermark leider negative Auswirkungen gebracht. Aus diesem Grund wurde seit 2018 die Versuchsarbeit der Anstalt verstärkt auf die Frostbekämpfung ausgerichtet. Frostheizungssysteme, die Frostberegnung und eine Windmaschine wurden in Betrieb genommen. Wegen der zunehmenden Häufigkeit der Spätfrostereignisse sind Flächenheizungssysteme im Obstbau ökonomisch nicht darstellbar. Für die bewährte Frostberegnung sind Wasservorräte nach den Erfahrungen im Jahr 2021 für mindestens 50, besser 70 Betriebsstunden notwendig. Das entspricht einer Menge von über zwei Millionen Liter pro Hektar Obstanlage und Jahr. Wenn die Wasserentnahme aus nahen Oberflächengewässern oder dem Grundwasserkörper nicht möglich ist, stehen enorme Investitionen für die Wasserbevorratung an. Die Windmaschine dagegen ist die ökonomischste Methode der Frostbekämpfung. Die Betriebskosten pro Stunde sind niedrig und der Einsatz ist auch im Falle von sehr vielen Frostnächten gesichert. Der erfolgreiche

Betrieb der Windmaschine ist nur bei Strahlungsfrösten möglich und der maximale Temperaturgewinn ist mit 2,5° Celsius limitiert. Die wichtigste Frostschutzmaßnahme ist und bleibt die Auswahl der Lage der Obstgärten, um in Zeiten des Klimawandels die Spätfrostgefahr von vornherein reduzieren zu können.

**Schlüsselwörter:** Obstbau, Spätfrost, Steiermark, Frostbekämpfung, Frostheizung, Windmaschine, Haidegg.

## **IMPORTANT FINDINGS OF THE LATE FROST CONTROL ATTEMPTS OF THE FRUIT AND VINEYARD STATION HAIDEGG AND CONCLUSIONS FOR THE FUTURE**

### **ABSTRACT**

Since 2016 there have been 5 years with spring frost events in Styria; only 2018 there were good yields in the fruit sector. Climate change has brought significant negative changes to the Styrian region. For this reason, various frost control methods were constructed and put into operation since 2018: the heating against frost, the frost sprinkling and the wind machine. Because of the frequency of spring frost during the flowering period in recent years, heating against frost is definitely uneconomical. For the proven method of frost irrigation, according to the experience of the year 2021, water supplies should be available for at least 50 operating hours, sometimes up to 70 operating hours. That is corresponding to at least 2 million litres of water per hectare orchard and season. If the required water can't be taken out of an existing body of water, large-scale investments are necessary. The wind machine is the most economical method of fighting against frost. The operating costs per hour are cheap and operational reliability is sure even after several nights of frost. The wind machine only works well in situations of radiation frost and its effect is limited to 2.5 degrees temperature gain maximum. The best possible selection of the position of a new orchard will remain the most important way of reducing spring frost damage in times of climate change.

**Keywords:** Fruit growing, spring frost, Styria, frost control, heating, wind machine, Haidegg.

# REGENERATIVE AGRICULTURE AND USE OF CLAY TYPOLOGY MAPPING

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## **ABSTRACT**

Soil plays a key role in the carbon cycle, which is often forgotten or does not receive proper attention. The present study aims to generate basic science for the understanding of soil carbon dynamics in agricultural areas and help in the conversion of this knowledge into good practices for the field. The clay typology was defined using magnetic susceptibility and the mapping was performed using geostatistical techniques. The pilot projects carried out in different contexts of Brazilian agriculture for agricultural management, different sustainable gains and benefits are obtained, among them: a) identification of areas with different phosphorus sorption potentials; b) variations in compaction potential of the soil in the order of 30% in the same soil type. c) strategic use of wastewater; d) Variation of the erosion potential; e) identification of areas for application of pre-emergence herbicides and nitrogen fertilizers.

**Keywords:** Tropical agriculture, soil governance and Greenhouse Gases Protocol (GHG), Carbon capture and storage.



## **UTJECAJ VRSTE POGONA NA STVARANJE VIBRACIJA I BUKE KOD TRIMERA**

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### **SAŽETAK**

Osim fizičkog napora, glavni izvor nelagode za radnike koji rade na stroju za košenje trave su uzrokovane vibracije i buka kojoj su izloženi. Poznato je da stalna izloženost vibracijama i buci uzrokuje ozbiljne zdravstvene probleme. Kako bi se spriječilo ugrožavanje zdravlja korisnika trimera od velike je važnosti i izbor samog

uređaja. Razlike u proizvedenim vibracijama i buci prilikom korištenja trimera uvjetovane su i vrstom pogona kojeg uređaj koristi. Ovaj rad prikazuje rezultate mjerenja buke i vibracija koje se javljaju prilikom korištenja električnih trimera i trimera s motorom s unutarnjim izgaranjem. Mjerene su vibracije koje se prenose sa stražnje i prednje ručke trimera na ruke operatera, i to pri najmanjem i najvećem broju okretaja motora. Prikazuje se usporedna analiza električnih trimera i trimera s motorom s unutarnjim izgaranjem za učinkovitosti njihovih izvora napajanja. Istraživanjem je potvrđeno kako su električni uređaji troškovno i obzirom na njihov izvor napajanja učinkovitiji te proizvode daleko manju buku i vibracije od uređaja sa motorom s unutarnjim izgaranjem čime se osigurava manji negativni utjecaj na zdravlje korisnika.

**Ključne riječi:** trimer, vibracije, buka, učinkovitost.

## **INFLUENCE OF DRIVE TYPE ON THE GENERATION OF VIBRATIONS AND NOISE IN TRIMMERS**

### **ABSTRACT**

In addition to physical exertion, the main source of discomfort for workers working on a lawn mower is the vibration and noise they are exposed to. Constant exposure to vibration and noise is known to cause serious health problems. In order to prevent endangering the health of the trimmer user, the choice of the device itself is of high importance. Differences in vibration and noise produced when using the trimmer are also determined by the type of drive used by the device. This paper presents the results of noise and vibration measurements that occur during the use of electric trimmers and trimmers with an internal combustion engine. Vibrations transmitted from the rear and front trimmer handles to the operator's arms were measured at the lowest and highest engine speeds. A comparative analysis of electric trimmers and internal combustion engine trimmers for the efficiencies of their power supplies is presented. Research has confirmed that electrical appliances are more cost-effective and considering their power source, and produce far less noise and vibration than devices with internal combustion engines, thus ensuring less negative impact on user health.

**Keywords:** trimmer, vibration, noise, efficiency.



# POMEN IN PREVERJANJE MELJAVE KRMIL IN KRMNIH MEŠANIC ZA NEPREŽVEKOVALCE

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## IZVLEČEK

Sestava krmnih mešanic je zelo pomembna, da živalim zagotovimo dovolj energije in hranljivih snovi. Pomembna je tudi velikost delcev, ki vpliva na izkoriščanje hranljivih snovi in zdravje prebavil in posledično na proizvodne rezultate. Homogenost mešanic je pomembna tudi v povezavi s porazdelitvijo posameznih frakcij in s tem z vnosom vseh potrebnih hranljivih snovi v pravih koncentracijah in razmerjih. Kmetje velikokrat doma pridelajo žita, ki jih pred pripravo krmnih mešanic tudi doma zmeljejo. Krmljenje doma pripravljene krmne mešanice lahko zaradi pregrebe ali prefine meljave vpliva na izkoriščanje krme in zdravje prebavil. Dijaki 3. in 4. letnika Šolskega centra Šentjur so prinesli vzorce 27 krmil in krmnih mešanic za katere smo naredili klasični sejalni test s sistemom sit in izračunali povprečno velikost delcev ter hitra testa, ki jih uporabljajo predvsem na Danskem, s starejšim in novejšim bigholmskim sitom. S tem smo želeli dijake vključiti v praktično delo, s čimer bi lažje dosegli zastavljene cilje pri učenju. Rezultati so pokazali, da je variabilnost med vzorci zelo velika. Rezultati kažejo na to, da je večina doma zmetih krmil in pripravljenih krmnih mešanic, za katere smo naredili sejalne teste, pregrebo mleta. Priporočamo uporabo bigholmskih sit za preverjanje meljave pripravljenih mešanic in prilagoditev meljave žit.

**Ključne besede:** krmila, krmne mešanice, neprežvekovalci, velikost delcev, sita, sejalni test.

# **IMPORTANCE AND VERIFIKATION OF GRIST (PARTICIPLE SIZE) OF FEEDSTUFFS AND FEED MIXTURES FOR NONRUMINANTS**

## **ABSTRACT**

The composition of feed mixtures is very important in providing animals with sufficient energy and nutrients. Particle size is also important as it affects nutrient utilisation and gastrointestinal health, and therefore production results. The homogeneity of the mixture is also important for particle size distribution and therefore for providing all the necessary nutrients in the right proportions and concentrations. Farmers often grow grain on their farms and then grind it at home before making feed mixes. Feeding homemade feed mixes can affect feed conversion and gastrointestinal health if they are ground too coarsely or too finely. Pupils of the 3<sup>rd</sup> and 4<sup>th</sup> year of the Šentjur School Centre brought samples of 27 feeds and feed mixtures. The classical sieve test with the sieve system was performed and the average particle size was calculated. In addition, the rapid test with the older and newer Bygholm sieve particle tester, which is common in Denmark, was used. This work was done to involve the students in practical work, which would facilitate the achievement of the set learning objectives. The results showed a very large variability between the samples. The results show that most of the tested home-ground feeds and prepared feed mixtures have a high percentage of large particles. We recommend the use of Bygholm sieves to check the grinding of prepared mixtures and to adjust the grinding of cereals.

**Keywords:** feedstuffs, feed mixtures, nonruminants, feed particle size, sieve, sieve test.

# POST IN UČINKI POSTENJA, CELOSTNA HRANA, BIODINAMIKA

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## IZVLEČEK

V raziskavi, ki je povzeta po magistrskem delu Post in učinki postenja, avtorice Sonje Bertalanč, je bilo zajeto področje terapevtskega posta s presnimi sadnimi, zelenjavnimi in sadno-zelenjavnimi sokovi po metodi, ki jo izvajajo v Zavodu Preporod, pomen ekoloških presnih živil, živil biodinamičnega porekla in njihov vpliv na človeka. Raziskava je potekala na študijskem programu Varnost hrane v prehrabeni verigi, na Fakulteti za kmetijstvo in biosistemske vede, v sodelovanju z Medicinsko fakulteto v Mariboru. Namen raziskave je bil ugotoviti vpliv ter rezultate različno dolgo trajajočega terapevtskega posta s presnimi sadnimi, zelenjavnimi in sadno-zelenjavnimi sokovi po metodi, ki jo izvajajo v Zavodu Preporod, pomen hrane iz ekološke oz. biodinamične pridelave ter presne hrane za anketirance. V raziskovalnem vzorcu je sodelovalo 271 anketirancev, starostna meja se je gibala med 20. in 83. letom. Ugotovljeno je bilo, da so imeli anketiranci ne glede na spol in starost izredno pozitivne izkušnje s postom in presno hrano na vseh nivojih, ter da dajejo prednost živilom ekološkega izvora. Kar 98 % anketirancev je trdilo, da sta post in presna hrana učinkovita in primerna, ter da jim ta način življenja pomaga k izboljšanju zdravstvenega stanja in počutja. 97 % anketirancem se je zdelo pomembno, da so živila, ki jih uživajo, ekološkega izvora. 98 % anketirancev je bilo mnenja, da so ostale tehnike (joga, meditacija, gibanje v naravi ...) zelo pozitivno vplivale in še bolj pripomogle k pozitivnim rezultatom ter dobrim izkušnjam postenja. Skoraj vsi anketiranci so imeli pozitivne izkušnje s postenjem in presno hrano tudi na duhovno/mentalnem področju. Velika večina anketirancev bi na podlagi lastnih izkušenj terapevtsko postenje po metodi, ki jo izvajajo v Zavodu Preporod, priporočala tudi ostalim ljudem.

**Ključne besede:** post, celostna hrana, biodinamično pridelana hrana, zdrav življenjski slog.

## **FASTING AND IT'S EFFECTS, WHOLESOME FOOD, BIODYNAMICS**

### **ABSTRACT**

In a study summarized after a master's thesis Fasting and it's effects of the author Sonja Bertalanič, was covered the area of therapeutic fasting with raw, fresh fruit, vegetable and fruit-vegetable juices, according to a method carried out by the institution Zavod Preporod (Preporod Institute). The research was carried out at the study program Food safety in the Agri-food Chain, at the Faculty of Agriculture and Life Sciences Maribor, in cooperation with the Medical Faculty Maribor. Importance of organic raw food, food produced in a biodynamic way in view of its influence on humans has been included as well. The purpose of the study was to determine the influence and results of various ways of long-lasting therapeutic fasting with raw, fresh fruit, vegetable and fruit-vegetable juices, according to the method carried out by Zavod Preporod (Preporod Institute) and the importance of organic raw food for respondents. The research sample consisted of 271 survey respondents, the average age ranged from 20 to 83 years. The research showed that respondents regardless of the gender and age, had extremely positive experiences with fasting and raw food consumption and they give priority to food of organic origin. As many as 98 % of respondents believed that fasting and raw fresh foods are very efficient and appropriate in constituting a way of life which helps to improve overall health and well-being. 97 % of respondents considered it important that the food they consume is of organic origin. 98 % of respondents believed that other techniques (yoga, meditation, outdoors exercise ...) have a further positive contribution to the final positive outcome and good experience of fasting. Almost all of them had a positive experience with fasting and raw food on the spiritual/mental field. A vast majority of respondents to a survey also recommended the fasting method carried out by Zavod Preporod to other people.

**Keywords:** fasting, wholesome food, biodynamic food, healthy life style.

## TRENDI PRI PRIDELAVI MLEKA V SLOVENIJI

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### IZVLEČEK

Mleko in mlečni izdelki spadajo med osnovne skupine živil za prehrano ljudi, zato z vidika samooskrbe zavzemajo pomembno mesto. Evropa proizvede približno tretjino vseh proizvedenih količin v svetu, zato spada med glavne izvoznice mleka in mlečnih izdelkov. V Sloveniji je bilo v obdobju 2000–2020 povprečno odkupljeno 509.598.622 litrov svežega mleka, leta 2000 le 437.492.370, leta 2020 pa že 563.213.814 litrov mleka (29 % povečanje). Odkupne cene svežega mleka pri pridelovalcih so se povečale za 14,3 %, drobnoprodajne cene pa 37,5 %. Korelacijska povezanost kaže povezanost med cenami svežega mleka in cenami mlečnih izdelkov. Med cenami mleka in količinami mleka in mlečnih izdelkov je močna povezanost, ki ima obratno smer, kar je posledica ponudbe in povpraševanja. Z metodo multiplo regresijske analize smo ocenili cenovno funkcijo cene svežega mleka. Empirični rezultati kažejo pozitivno povezanost med cenami svežega mleka in cenami posameznih vrst mlečnih izdelkov in količinami mlečnih izdelkov.

**Ključne besede:** mleko in mlečni izdelki, proizvodnja, prodaja, Slovenija.

## TRENDS IN MILK PRODUCTION IN SLOVENIA

### ABSTRACT

Milk and dairy products belong to the basic groups of foods for human consumption, so they occupy an important place from the point of view of self-sufficiency. Europe produces about a third of all the world's production, making it one of the main exporters of milk and dairy products. In the period 2000–2020, an average of 509,598,622 liters of fresh milk were purchased in Slovenia, in 2000 only 437,492,370, and in 2020 563,213,814 liters of milk (29% increase). Purchase prices of fresh milk at producers increased by 14.3% and retail prices by 37.5%. The correlation shows the correlation between the prices of fresh milk and the prices of dairy products. There is a strong correlation between the prices of milk and the quantities of milk and dairy products, which has the opposite direction, as a result of supply and demand. Using the method of multiple regression analysis, we estimated the price function of the price of fresh milk. Empirical results show a positive correlation between the prices of fresh milk and the prices of individual types of dairy products and the quantities of dairy products.

**Keywords:** milk and dairy products, production, sales, Slovenia.

# VPLIV TESTIRANJA STROJEV ZA VARSTVO RASTLIN NA EKSPLOATACIJSKI POTENCIAL TER VARSTVO OKOLJA

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## **IZVLEČEK**

V nalogi je obdelan vpliv testiranja strojev za varstvo rastlin na eksploatacijski potencial ter varstvo okolja. Naloga obsega neobvezno testiranje strojev za varstvo rastlin od leta 1989-1994 in obvezno testiranje strojev od 1995-2010 leta ter pregled stanja do leta 2021 v celjski regiji. Testiranje je bilo opravljeno na 13759 strojih za varstvo rastlin, od tega 849 v času neobveznega testiranja in 12910 strojev v času zakonsko obveznega testiranja. Raziskave so pokazale, da je veliko strojev v okvari, katere pa pri neobveznem testiranju niso odpravljali. Po testiranju je bilo med vsemi 16% - 27% izpravnih strojev, kar pomeni, da je bilo v času neobveznega testiranja med 73% in 84% strojev, pri katerih je bila slaba razporeditev fitofarmaceutskih sredstev. V času obveznega testiranja se je stanje strojev za varstvo rastlin bistveno izboljšalo. Pri testiranju se ugotavlja vse manj okvar, izpravnost strojev za varstvo rastlin pa se je izboljšala med 80% - 100%. Po letu 2010 so po testiranju izpravni vsi stroji za varstvo rastlin na našem območju testiranja. S testiranjem strojev za varstvo rastlin se je izboljšalo stanje strojev, s tem se dosega namen boljšega varovanja okolja, kar pa ima pomembno vlogo v proizvodnji zdrave hrane.

**Ključne besede:** varstvo rastlin, testiranje, okvare, stanje strojev.

# **THE IMPACT OF TESTING MACHINERY FOR PLANT PROTECTION ON EXPLOITATION POTENTIAL AND ENVIRONMENTAL PROTECTION**

## **ABSTRACT**

In this paper, we examine the impact of testing machinery for plant protection on exploitative potential and environmental protection. The paper covers the non-mandatory testing of plant protection machinery between 1989 and 1994 and the mandatory testing of machinery between 1995 and 2010, as well as an overview of the situation until 2021 in the Celje region. The testing was carried out on 13,759 plant protection machines, of which 849 were tested during the non-mandatory testing, whereas 12,910 were tested during the mandatory testing. The research showed that many machines were defective, which was not corrected during the non-mandatory testing. After testing, between 16% and 27% of all machines were functioning properly, which indicates that between 73% and 84% of machines had a poor distribution of phyto-pharmaceutical agents at the time of the non-mandatory testing. However, the condition of plant protection machinery improved significantly during the mandatory testing. Testing reveals fewer and fewer defects, furthermore, the performance of plant protection machinery has improved by between 80% and 100%. After 2010, all plant protection machines in our testing area are working properly after testing. The testing of the plant protection machinery has improved the condition of the machinery, thus achieving the objective of enhanced environmental protection, which plays an important role in the production of healthy food.

**Keywords:** plant protection, testing, defects, condition of machinery.



# DOPOLNILNE DEJAVNOSTI NA KMETIJAH V OBČINI SLOVENSKA BISTRICA KOT PODJETNIŠKA PRILOŽNOST ZA PODEŽELJE

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## **IZVLEČEK**

Namen prispevka je oceniti dopolnilne dejavnosti na kmetiji kot podjetniško priložnost in možnost za ustvarjanje dodatnih kvalitativnih delovnih mest na kmetiji. Zanima nas struktura, vrste in obseg dopolnilnih dejavnosti na kmetiji v Občini Slovenska Bistrica v primerjavi s slovenskim povprečjem. Kmetijstvo v Občini Slovenska Bistrica zaposluje 8 % aktivnega prebivalstva, kar jo uvršča krepko nad slovensko povprečje. V občini je 805 kmetij, ki oddajajo zbirno vlogo, od teh ima 69 kmetij registrirano dopolnilno dejavnost. Povprečno ima kmetija registrirane 3 vrste dopolnilne dejavnosti. Skupaj imajo kmetije registriranih 222 vrst dopolnilnih dejavnosti, ena od teh kmetij celo 21. Širše območje Slovenske Bistrice ima še številne neizrabljene potencialne v smislu podjetniških priložnosti. V primerjavi s slovenskim povprečjem je v Slovenski Bistrici registriranih krepko manj dopolnilnih dejavnosti, povezanih s tradicionalnimi znanji, storitvami in izdelki ter v turizmu na kmetiji. Priložnosti za turizem na kmetiji so predvsem v doživljajskem turizmu zaradi bogate naravne in kulturne dediščine ter pestre lokalne kulinarne ponudbe.

**Ključne besede:** Dopolnilne dejavnosti na kmetiji, podjetniška priložnost, Slovenska Bistrica.

# **SUPPLEMENTARY ACTIVITIES ON FARMS IN THE MUNICIPALITY OF SLOVENSKA BISTRICA AS AN ENTREPRENEURIAL OPPORTUNITY FOR THE COUNTRASIDE**

## **ABSTRACT**

The purpose of this paper is to evaluate complementary activities on a farm as an entrepreneurial opportunity as well as an opportunity to create additional quality jobs on the farm. We are interested in the structure, types and scope of supplementary activities on the farms in the Municipality of Slovenska Bistrica compared to the Slovenian average. Agriculture employs 8 % of the active population in the Municipality of Slovenska Bistrica, which places it well above the Slovenian average. There are 805 farms in the municipality that submit a collective application. Of these, 69 farms have a registered supplementary activity. On average, a farm has 3 registered types of supplementary activities. In total, farms have 222 registered types of supplementary activities, one of these farms even 21. The wider area of Slovenska Bistrica has many unused potentials in terms of entrepreneurial opportunities. Compared to the Slovenian average, there are significantly fewer supplementary activities registered in Slovenska Bistrica related to traditional knowledge, services and products, as well as farm tourism. Opportunities are mainly in adventure tourism due to the rich natural and cultural heritage and the varied local culinary offer.

**Key words:** supplementary activities on the farm, entrepreneurial opportunity, Slovenska Bistrica.

# RAZLISTANJE VINSKE TRTE KOT UKREP ZA ZMANJŠANJE POJAVA OCETNEGA CIKA NA GROZDJU

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## **IZVLEČEK**

Razlistanje ali defoliacija vinske trte je tehnološki ukrep v vinogradništvu, ki se ga intenzivneje proučuje v zadnjih desetletjih. Poznani so določeni pozitivni učinki razlistanja, kot npr. manjši pojav gnilobe grozdja in nižja vsebnost skupnih kislin. V prispevku predstavljamo ugotovitve glede odstranjevanja listov vinske trte v povezavi z razvojem očetnega cika na grozdnih jagodah. Na sortah laški rizling, rumeni muškati in modri pinot smo v začetku julija v eni skupini trsov povsem odstranili liste v coni grozdja, v drugi skupini smo odstranili polovico (delno razlistanje) listov in v tretji skupini listov v coni grozdja nismo odstranjevali. Poskus smo izvedli leta 2019 v vinogradih posestva Biotehniške šole Maribor. Pri sortah laški rizling in rumeni muškati se je razlistanje (popolno in delno) pokazalo kot učinkovit ukrep za zmanjšanje pojava očetnega cika. Pri sorti modri pinot je bil pojav očetnega cika najmočnejši. Pri sorti modri pinot se razlistanje ni pokazalo kot učinkovit ukrep za zmanjšanje pojava očetnega cika na grozdnih jagodah.

**Ključne besede:** vinska trta, sorta, razlistanje, očetni cik.

## **LEAF REMOVAL FROM VINES AS A MEASURE TO REDUCE THE OCCURRENCE OF SOUR ROT IN GRAPES**

### **ABSTRACT**

Leaf removal or defoliating vines is a technological measure in viticulture that has been studied more intensively in recent decades. Certain positive effects of defoliation are known, for instance less occurrence of grape rot and lower content of total acids. In this paper, we present the findings regarding the removal of vine leaves in connection with the development of sour rot in grapes. In the beginning of July, we conducted an experiment in the Laški Riesling, Yellow Muscat and Pinot Noir varieties. Leaves in the grape zone were completely removed in one group of vines, half (partial defoliation) of leaves were removed in the other group and leaves in the grape zone were not removed in the third group. The experiment was performed in 2019 in the vineyards of the estate of the Biotechnical School Maribor. In the varieties Laški Riesling and Yellow Muscat, defoliation (complete and partial) has been shown to be an effective measure to reduce the occurrence of sour rot. In the Pinot Noir variety, the occurrence of sour rot was the strongest. In the Pinot Noir variety, defoliation has not been shown to be an effective measure to reduce the occurrence of sour rot in grapes.

**Key words:** vine, variety, leaf removal, sour rot.

# USPEŠNOST ZAVIRANJA ENCIMSKEGA RJAVENJA JABOLČNIH KRHLJEV Z UPORABO RAZLIČNIH SNOVI

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## IZVLEČEK

Preučili smo vzorce jabolčnih krljev, ki so bili potopljeni v različne raztopine in sušeni pri 70 °C za 10 ur. Šest različnih aditivov, ki imajo potencial vplivanja na encimsko rjavenje smo razdelili v tri kategorije. Oba zaviralca rjavenja znotraj posamezne kategorije smo primerjali z uporabo enakih koncentracij raztopin. Prvo kategorijo so predstavljale različne koncentracije citronske in askorbinske kisline. Citronska kislina je najbolj učinkovito zavirala encimsko rjavenje in ohranila izgled lupine. Askorbinska kislina je dobro ohranila izgled olupka, a je prispevala k pojavu rdeče obarvanosti v mesnatem delu jabolčnih krljev. Drugo kategorijo so predstavljale različne koncentracije medu in soli. Raztopina medu je bila učinkovita pri ohranjanju barve mesnatega dela in pri izgledu lupine. Sol je dobro zavirala pojav encimskega rjavenja, pojavila pa se je nagubanost jabolčnih krljev. Tretjo kategorijo sta predstavljala voda brez dodatkov in različno koncentriran zeleni čaj. Voda je pokazala, da se učinek ostalih protiporjavitvenih snovi vsekakor kaže in ni zanemarljiv. Zeleni čaj ne zavira encimskega rjavenja, ampak k njemu celo prispeva.

**Ključne besede:** jabolčni krlji, encimsko rjavenje sadja, protiporjavitvene snovi.

# **EFFICIENCY OF ENZYMATIC BROWNING INHIBITION IN APPLE SLICES USING VARIOUS SUBSTANCES**

## **ABSTRACT**

Samples of apple slices, which were immersed in various solutions and dried at 70 ° C for 10 hours, were examined. Six different additives that have the potential to affect enzymatic browning were divided into three categories. Both browning inhibitors within each category were compared using the same concentrations of solutions. The first category included different concentrations of citric and ascorbic acid. Citric acid most effectively inhibited enzymatic browning and maintained the appearance of apple peel. Ascorbic acid retained the appearance of the peel well, but contributed to the appearance of a red discoloration in the flesh part of the apple slices. The second category included different concentrations of honey and salt. The honey solution was effective in maintaining the colour of the flesh part and the appearance of the peel. Salt inhibited the appearance of enzymatic browning well, but visibly contributed to the wrinkly appearance of apple slices. The third category included water without additives and green tea in different concentrations. Water has shown that the effect of other browning inhibitors is definitely evident and not negligible. Green tea does not inhibit enzymatic browning, but even contributes to it.

**Keywords:** apple slices, enzymatic browning of fruits, antibrowning substances.

# PREDNOSTI IN SLABOSTI INOVATIVNIH STRATEGIJ V POSTOPKIH PREDELAVE V ŽIVILSTVU IN ŽIVILSKI INDUSTRIJI

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## IZVLEČEK

Z napredkom in zmeraj hitrejšim razvojem tehnologije ter s potrebo po inovacijah zaradi konkurenčnosti, nižanja stroškov, boljših produktov ter drugih razlogov so inovacije nepogrešljiv element tudi v živilski industriji in na področju prehrane. Pri inoviranju v živilsko-predelovalni industriji so tako gonila kot ovire, veliko dejavnikov pa vpliva na to, ali je smiselno inovirati. Obstajajo še podjetja, ki kot protiutež industrijski pridelavi hrane in njeni proizvodnji ostajajo zvesti tradicionalnim postopkom zaradi boljše kakovosti končnih izdelkov, ne glede na inovacije. Odnos potrošnikov do hrane in njihove prehranjevalne navade se v zadnjem desetletju spreminjajo, saj se ljudje vedno bolj zavedajo, da hrana vpliva na njihovo zdravje, zaradi česar sta tudi vegetarijanstvo in veganstvo v porastu in ju ljudje dojemajo kot socialno (oz. družbeno) inovacijo zaradi odgovornosti do živali in do njihovega dobrega počutja. Spremembe v prehranjevanju so se v zadnjih dveh letih pojavile tudi zaradi situacije v svetu, ko so bile vse dejavnosti, vključno z industrijo, podrejene pandemiji koronavirusa.

**Ključne besede:** trendi v prehrani, predelava hrane, inovativnost, prehranska industrija, pandemija.

# **ADVANTAGES AND DISADVANTAGES OF INNOVATIVE STRATEGIES IN PROCESSING PROCESSES IN THE FOOD AND FOOD INDUSTRY**

## **ABSTRACT**

With the advancement and ever faster development of technology and the need for innovation due to competitiveness, cost reduction, better products and other reasons, innovation is an indispensable element in the food industry and in the field of nutrition. There are both drivers and barriers to innovation in the food processing industry, and many factors influence whether it makes sense to innovate. There are also companies that, as a counterbalance to industrial food production, remain faithful to traditional processes due to better quality of finished products, regardless of innovation. Consumer attitudes towards food and their eating habits have changed over the last decade as people become increasingly aware that food affects their health, which is why vegetarianism and veganism are on the rise and people perceive them as a social innovation. responsibility for animals and their welfare. Changes in diet over the last two years have also been due to the situation in the world, where all activities, including industry, have been subordinated to the coronavirus pandemic.

**Key words:** food trends, food processing, innovation, food industry, pandemic.



# OD LESNIH ODPADKOV DO UPORABNEGA IZDELKA V TURIZMU

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## IZVLEČEK

Krožno gospodarstvo postaja smerokaz delovanja na vseh področjih življenja. Evropska komisija narekuje brezogljično družbo. Tudi v šolstvu stremimo k temu, da dijake pripravimo na delovanje in življenje v prihodnosti. Zato smo jim zastavili kompleksno nalogo za razvoj produkta, ki zasleduje cilje trajnostne rabe, krožnega gospodarstva in pouporabe izdelka. V prvi fazi smo dijake seznanili s konceptom trajnostnega razvoja in krožnega gospodarstva ter s cilji projekta in jim predstavili primere dobrih praks. V drugi fazi so dijaki samostojno raziskovali in razvijali izdelke po skupinah. V zaključni fazi so dijaki izbrali zmagovalni izdelek. To je postal lesen krožnik za večkratno uporabo v turistične namene, ki ima možnost pouporabe. Dijaki so ga nato skupinsko nadgradili v smeri dodatne funkcionalnosti. Tako so preko viharjenja možganov doprinesli h končnemu izdelku, dana naloga jih je spodbudila tudi k podjetniškemu razmišljanju. Glavni doprinos je predstavljal zagon miselnega procesa. Dijaki so tudi po zaključeni nalogi in v okviru ostalih predmetov, intenzivno iskali rešitve kako čim bolj skleniti in osmisliti življenjski krog materiala.

**Ključne besede:** krožno gospodarstvo, podjetništvo, pouporaba, raziskovanje, trajnostni razvoj, turizem, viharjenje možganov.

# FROM WOOD WASTE TO A USEFUL PRODUCT IN TOURISM

## ABSTRACT

The circular economy is becoming a guiding principle for action in all areas of life. The European Commission is dictating a carbon neutral society. In education, we are also striving to prepare students for action and life in the future. That is why we have given them a complex task to develop a product that pursues the goals of sustainable use, circular economy and product reuse. In the first phase, we introduced the students to the concept of sustainability and circular economy and the objectives of the project. We presented examples of good practice. In the second phase, the students researched and developed the products independently in groups. In the final phase, the students chose the winning product. This was a reusable wooden plate for tourism purposes, which has the potential of being reused. The students then worked as a group to develop it towards additional functionalities. They brainstormed new ideas for the final product. The task also encouraged them to think entrepreneurially. The main contribution was a stimulation of the thought process. Even after the assignment, and within other subjects, the students intensively searched for solutions to close the gap and make sense of the material life cycle as much as possible.

**Keywords:** afteruse, brainstorming, circular economy, entrepreneurship, research, sustainable development, tourism.

# VPLIV VREMENSKIH POGOJEV NA POJAVNOST PODLUBNIKOV

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## **IZVLEČEK**

Podlubniki lahko v gozdovih povzročijo veliko gospodarsko škodo. Kako vremenski pogoji oz. ujme vplivajo na porast podlubnikov, smo praktično preverjali na gozdnogospodarski enoti Šentjur. Pri tem smo uporabili dve metodi, in sicer preverjanje števila podlubnikov v vabah v najtoplejših mesecih leta 2018 ter analiziranje sekundarnih podatkov o številu posekanih dreves zaradi pojava podlubnikov v obdobju od leta 2001 do 2017. V vabah smo nadzirali prisotnost velikega in malega smrekovega lubadarja, ki povzročata največ škode. Ugotovili smo, da se je pri povečani povprečni dnevni temperaturi najbolj povečalo število malega smrekovega lubadarja, število velikega pa je ostalo v mejah normale. Pri drastičnem padcu temperature v mesecu juniju pa se je razvoj obeh lubadarjev ustavil. Kombinacija visokih povprečnih dnevnih temperatur v najtoplejših mesecih, visok delež padavin ter ujme, še povečajo število poškodovanih dreves zaradi pojava podlubnikov. Človek nima neposrednega vpliva na vremenske pogoje, lahko pa z vestnim gospodarjenjem oziroma pravočasnimi sanacijskimi postopki omeji pojavnost podlubnikov.

**Ključne besede:** gozdovi, podlubniki, veliki, mali, smrekov lubadar, vabe, vremenski pogoji, posek dreves.

## **INFLUENCE OF WEATHER CONDITIONS ON THE OCCURRENCE OF BARK BEETLES**

### **ABSTRACT**

Bark beetles can cause great economic losses in forests. At the Šentjur Forest Management Unit, we studied how the weather conditions especially inclement weather could affect the incidence of bark beetles. We used two methods, namely checking the number of bark beetles in baits in the warmest months of 2018 and by analysing secondary data on the number of cut down trees, due to the occurrence of bark beetles in the period from 2001 to 2017. In the baits, we controlled the presence of the great and small spruce bark beetle, which are the two species that have been known to cause the most damages. We found that with an increase in the average daily temperatures, the number of small spruce bark beetle increased the most, while the number of great spruce bark beetles remained within normal limits. However, with a drastic drop in temperature in June, the development of both species stopped. The combination of high average daily temperatures in the warmest months and the high amount of rainfall and inclement weather, further increase the number of damaged trees due to the occurrence of bark beetles. Man has no direct influence on weather conditions; however, he could limit the occurrence of bark beetles, and subsequent damages, by diligent management system e.g. timely remediation activities.

**Keywords:** forests, bark beetles, great, small, spruce bark beetle, bait, weather conditions, tree felling.

## POJAVNOST OHRATOKSINA A V KRMI MED LETOMA 2010 IN 2015 V SLOVENIJI

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### **IZVLEČEK**

Mikotoksini so sekundarni produkti specifičnih sevov plesni. Izpostavljenost mikotoksinom lahko povzroči negativne učinke na zdravje ljudi in živali. V okviru uradnega nadzora živil se vsebnost mikotoksinov v živilih in krmi redno analizira. Kmetijski pridelki so zaradi spremenljivega vremena bolj izpostavljeni tovrstnim okužbam, predvsem so možne okužbe pridelkov z aflatoksini, ohratoksini, trihoteceni, zearalenoni, fumonizini, tremorgenimi mikotoksini in ergot alkaloidi. V tej raziskavi smo pregledali in vrednotili rezultate uradnega nadzora krme glede vsebnosti ohratoksina A (OTA). Podatke smo pridobili iz Urada RS za varnost hrane, veterinarstvo in varstvo rastlin. Pojavnost OTA v krmi smo ugotavljali za 237 vzorcev krme, ki so bili analizirani med letoma 2010 in 2015. Izmed 237 vzorcev sta bila z OTA onesnažena dva vzorca, ki nista presegla mejnih vrednosti.

**Ključne besede:** mikotoksini, ohratoksin a, slovenski uradni nadzor, krma.

## **THE CONTENT OF OCHRATOXIN A IN FEED BETWEEN 2010 AND 2015 IN SLOVENIA**

### **ABSTRACT**

Mycotoxins are secondary fungal metabolites. Exposure to mycotoxins might result in several human and animal health disorders. Under Slovenian official food control the presence of mycotoxins in food and feed is regularly analysed. Due to unstable weather conditions agricultural commodities are more exposed to crop contamination. Aflatoxins, ochratoxins, trichothecenes, zearalenones, fumonisins, tremorgenic mycotoxins and ergot alkaloids present the greatest problem in agriculture. This research investigates the presence of ochratoxin A (OTA) in feed based on data obtained from the Slovenian Administration for Food Safety, Veterinary Sector and Plant Protection. 237 samples of feed and raw feed material were analysed between the years of 2010 and 2015. Two of the 237 samples contained OTA in a concentration below the European Commission guidance level.

**Keywords:** mycotoxins, ochratoxin a, Slovenian official control, feed.

# TRAJNOSTNO USMERJENA PREDELAVA NARAVNIH SUROVIN V INDUSTRIJI: TRIJE PRIMERI DOBRE PRAKSE

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## IZVLEČEK

Izrazit porast prebivalstva od leta 1950 naprej ima zelo negativen vpliv na okolje. Eden izmed razlogov za to je izsekavanje Amazonskega in drugih tropskih gozdov zaradi predelave lesa in izdelave lesnih izdelkov. Zato je trajnostna naravnost bistvenega pomena za dostopnost lesa na dolgi rok in za trajnostne lesne derivate, pri čemer so inovativni pristopi ključnega pomena. Vedno več italijanskih lesnih podjetij se preusmerja v trajnostno usmerjeno proizvodnjo, kar dokazujejo tudi nekateri certifikati.

Vedno več držav namenja pozornost razvoju strategij, ki bi izboljšale trenutno stanje na področju okoljskih problematik. To počno na različne načine: Slovenija, na primer, je leta 2012 pripravila dokument Izhodišča za prestrukturiranje slovenske lesnopredelovalne industrije. Podobno strategijo je pripravila tudi Velika Britanija. Obe namreč stremita k povečevanju porabe lesne biomase za pridobivanje energije, ker je to ena izmed prednostnih nalog pri spodbujanju uporabe obnovljivih virov.

**Ključne besede:** lesna industrija, trajnostni razvoj, inovativni pristopi, lesni izdelki, lesna goriva, trajnostni razvoj, strategije.

# **SUSTAINABLE PROCESSING OF NATURAL RAW MATERIALS IN INDUSTRY: THREE EXAMPLES OF GOOD PRACTICE**

## **ABSTRACT**

An increase in population since 1950 has had a very negative impact on the environment. One of the reasons for this is the deforestation of the Amazon and other tropical forests due to wood processing and the manufacture of wood products. Therefore, a sustainable approach is essential for the long-term accessibility of wood and for sustainable wood derivatives, with innovative approaches being crucial. More and more Italian wood companies are switching to sustainable production, as evidenced by some certificates.

More and more countries are paying attention to the development of strategies that would improve the current situation in the field of environmental issues. They implement this in various ways: in 2012, Slovenia, for example, prepared a document Starting point for the restructuring of the Slovenian wood processing industry. A similar strategy has been developed by the United Kingdom. Both are striving to increase the consumption of wood biomass for energy production, as this is one of the priorities in promoting the use of renewable sources.

**Key words:** wood industry, sustainable development, innovative approaches, wood products, wood fuels, sustainable development, strategies.



# ČLOVEKOVA POMOČ OPRAŠEVALCEM

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## IZVLEČEK

Današnje kmetovanje je zaradi človeške lakomnosti, požrešnosti in hlepenja po dobičku postalo industrija, ki s strupenim škropljenjem kulturnih rastlin v naravo vnaša razne kemične proizvode, kot so kupljeni umetni dodatki za hitrejšo in lepšo rast pridelkov. Z invazivno košnjo in pašo, z izravnavanjem in odstranjevanjem z drevjem in grmovjem porasle površine uničujejo življenjsko okolje. Ob tem pa nastaja problem vedno manjšega števila oprashačev, ki pa so za delovanje ekosistema ključnega pomena.

Oprashačevanje se je razvijalo milijone let in je koristno tako za cvetnice kot tudi za oprashačevce. Tretjina hrane, ki jo pojedete, je odvisna od oprashačev.

Zaradi tega moramo največjo mero pomoči nameniti oprashačevcem, katerim zelo težko globalno pomagamo s čistim okoljem, saj imata kmetijstvo in industrija pri tem velik delež. Pomoč jim moramo nuditi v obliki dosajevanja medovitih rastlin in pri razmnoževanju več, novih, mlajših oprashačev.

**Ključne besede:** oprashačevanje, medovite rastline, onesnaževanje, kmetijstvo, pomoč oprashačevcem.

## **HUMAN AID TO POLLINATORS**

### **ABSTRACT**

Due to the human greed, gluttony and desire for profit, today's farming has become the industry which, by poisonous spraying of the culturally significant plants, introduces various chemical products as purchased artificial supplements for a faster and better harvest growth. The living environment is being destroyed through invasive mowing and grazing and by levelling and clearing areas covered with trees and shrubs. This raises the problem of the decreasing numbers of pollinators which are vital for the functioning of the ecosystem.

Pollination has been developing for millions of years and is useful for flowering plants as well as the pollinators. One third of the food one consumes depends on pollinators.

Because of this, the highest extent of aid should be dedicated to pollinators that are globally difficult to help with clean environment since farming and the industry play a great role in this. Help should be offered in the form of planting new honey plants and by reproducing more, new and younger pollinators.

**Key words:** pollination, honey plants, pollution, farming, aid to pollinators.

# TRAJNOSTNO GOSPODARJENJE NA ZAVAROVANIH OBMOČJIH EKOSISTEMOV

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## IZVLEČEK

Ekosistemi nudijo človeški družbi številne oprijemljive koristi. To so vse storitve in dobrine, imenovane ekosistemske storitve, ki jih ljudje uživajo zaradi delovanja ekosistemov. Organizacija združenih narodov poudarja, da je človeška družba v zadnjih 50 letih spreminjala ekosisteme hitreje kot v katerem koli obdobju človeške zgodovine. Namen prispevka je predstaviti ekosistem slovenskega podeželja in območij Nature 2000 ter možnosti trajnostnega razvoja, ki ima podlage v čudovitih naravnih danostih krajine in skupnemu konsenzu deležnikov, kakovostnem izobraževanju mladih in sprejetih resolucijah, zakonodaji. Odlični rezultati se kažejo z udejanjanem EU projektov LIFE, EIP za ustrezne ukrepe. Z veseljem smo prikazali primer projektnega dela manjše ekološke kmetije Buser preko LEADER CLLD razpisanih sredstev za upravljanje rastišča velikonočnice in razvoj dopolnilnih dejavnosti. Na področju izobraževanja predstavljamo primer inovativnega učenja. Mlade udeležence smo vključili v sodelovanje z lokalno skupnostjo. V Ipvavčevem letu 2020 smo zasajevali z avtohtono sorto Ipvavčevo bogatinko, ki so jo sami razmnoževali, negovali in sadili v krajino.

**Ključne besede:** ekosistem, Natura 2000, trajnostni razvoj, kulturna krajina.

## **SUSTAINABLE MANAGEMENT IN PROTECTED AREAS OF ECOSYSTEMS**

### **ABSTRACT**

Ecosystems offer many tangible benefits to human society. Ecosystem services are services that people can benefit from because of the functioning of ecosystems. The United Nations have pointed out that human society has changed ecosystems more in the last 50 years than in any period of human history. The purpose of this paper thus is to present the Slovenian rural ecosystem, and Natura 2000 areas, all its opportunities for sustainable development, which is based on the natural resources of the landscape and the common consensus of stakeholders, quality education of young people and adopted resolutions, legislation.. The implementation of EU projects LIFE, EIP for appropriate measures - has led to excellent results. With great pleasure we present an example of the project work of a small organic farm Buser, through LEADER CLLD tendered funds for the management of Pulsatilla grandis site and the development of complementary activities. In the field of education, we present an example of innovative learning. We have involved young participants in cooperation with the local community. In Ipavec's year 2020, we planted Ipavec's »bogatinka« (an autochthonous sort of apple tree), which we propagated, nurtured and planted in the landscape.

**Key words:** ecosystem, Natura 2000, sustainable development, cultural landscape.

# **SPODBUDE ZA REGIONALNI RAZVOJ IN PROMOCIJO PODEŽELJA NA OBMOČJU LOKALNE AKCIJSKE SKUPINE DOBRO ZA NAS**

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## **IZVLEČEK**

Program razvoja podeželja 2014 – 2020 je skupni dokument Republike Slovenije in Evropske komisije za doseganje ciljev strategije Evropa 2000 in pomeni programsko podlago za črpanje sredstev iz Evropskega kmetijskega sklada za razvoj podeželja in Evropskega sklada za regionalni razvoj. Lokalna akcijska skupina Dobro za nas, ki vključuje štiri občine in sicer Makole, Poljčane, Rače – Fram in Slovenska Bistrica, je bila uspešna na razpisu za sofinanciranje spodbud za regionalni razvoj in promocijo podeželja. Iz Evropskega kmetijskega sklada za razvoj podeželja je sofinanciranih deset operacij (projektov) in iz Evropskega sklada za regionalni razvoj pa je sofinanciranih devet operacij (projektov). Tematska področja za sofinanciranje so ustvarjanje novih delovnih mest, razvoj osnovnih storitev, varstvo okolja in ohranjanje narave ter večja vključenost mladih, žensk in drugih ranljivih skupin. Lokalna akcijska skupina Dobro za nas se povezuje in sodeluje tudi z drugimi lokalnimi akcijskimi skupinami v Sloveniji. Kot dober primer sodelovanja lahko štejemo spletno tržnico Jem domače in Zgodbe rok in krajev, ki povezujejo lokalne pridelovalce in rokodelce.

**Ključne besede:** Lokalna akcijska skupina Dobro za nas, razvoj podeželja, promocija.

## **INCENTIVES FOR REGIONAL DEVELOPMENT AND RURAL PROMOTION OF THE LOCAL ACTION GROUP DOBRO ZA NAS (GOOD FOR US)**

### **ABSTRACT**

The Rural Development Program 2014-2020 is a joint document of the Republic of Slovenia and the European Commission, which represents the program basis for drawing funds from the European Agricultural Fund for Rural Development and the European Regional Development Fund. The local action group Dobro za nas, which includes four municipalities, namely Makole, Poljčane, Rače - Fram, Slovenska Bistrica, is successful in co-financing incentives for regional development and rural promotion. It co-financed ten operations (projects) from the European Agricultural Fund for Rural Development and nine operations (projects) from the European Regional Development Fund. The thematic areas for co-financing are job creation, development of basic services, environmental protection and nature conservation, as well as greater involvement of young people, women and other vulnerable groups. Local action group Dobro za nas connects and cooperates with other local action groups in Slovenia. A good example of cooperation is the online market Jem domače, which provides a wide selection of quality products as well as products with verified origin and Stories of hands and places that connect and enable development of handicrafts in Slovenia.

**Key words:** Local Action Group Good for us, rural development, promotion.

# SOUSTVARJANJE UČENJA PRI POUKU KNJIŽEVNOSTI

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## IZVLEČEK

V prispevku so predstavljena nekatera književna dela, ki spodbujajo soustvarjanje učenja pri pouku slovenščine v triletnem izobraževalnem programu na Srednji poklicni in strokovni šoli Šolskega centra Šentjur. Učenje je temelj vzgojno-izobraževalnega procesa, zametki učenja pa segajo v otroštvo učečega. Za del naših sposobnosti in veščin se niti ne zavedamo, kdaj smo se jih naučili – z razvojem in odraščanjem; za učenje kot pomnjenje učne snovi pa je potreben čas in znanje, kako to usvojiti. Najpomembneje je, da znamo to znanje povezati še z drugim znanjem ali uporabiti v praksi. Učitelji pri pouku povezujemo znanja iz različnih področij, predvsem pa ustvarjamo spodbudno okolje, kjer lahko učenci ali dijaki soustvarjajo učenje. Pri pouku slovenščine lahko to izjemno dobro izpeljemo v okviru ur književnosti, saj nam različna literarna dela omogočajo širok nabor tem za pogovor, debato ter pisno poudarjanje. Učenci ali dijaki imajo možnost, da skupaj z učitelji oblikujejo pridobljeno znanje, ga pomnijo in povezujejo z ostalimi veščinami. Soustvarjanje učenja pri pouku književnosti doprinaša natančnejšo interpretacijo besedil in povečuje zmožnosti dijakovega prepoznavanja medbesedilnosti.

**Ključne besede:** soustvarjanje, učenje, slovenščina, književnost, znanje.

## CO-SHAPING OF LEARNING AT LITERATURE TEACHING

### ABSTRACT

This paper presents some literary works which stimulate the co-shaping of learning in Slovene lessons. Learning presents a basis for the educational process. It starts developing in the learner's childhood. Part of our abilities and skills are mastered unknowingly during development and growing-up; whereas memorization of other subject matters requires time and a certain know-how. It is very important to connect different areas of knowledge or to use the acquired knowledge in practice. During lessons, teachers connect different areas of knowledge and, above all, try to form a stimulating environment, where pupils and students can co-shape the process of learning. The Slovene literature lessons give us a good opportunity to do so, because different literary works enable a broad set of discourse themes, debates, and written recreating. Pupils and students have the opportunity to shape the acquired knowledge with their teacher, to memorize it and to connect it with other skills. Co-shaping of learning in literature lessons contributes to a more accurate interpretation of texts and increases the student's ability to recognize intertextuality.

**Keywords:** co-shaping, learning, Slovene, literature, knowledge.



# RAZVOJ CRAFT PIVOVARSTVA V SLOVENIJI IN ZNAČILNOSTI CRAFT PIV

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## **IZVLEČEK**

Pivovarska dejavnost ima na slovenskem večstoletno tradicijo. Zadnja desetletja so na eni strani zaznamovali prevzemi obeh naših največjih pivovarn s strani tujih lastnikov in velik porast novo nastalih manjših pivovarn. Za manjše pivovarne, ki piva varijo pretežno po tehnologiji zgornjega vrenja, poleg tega uporabljajo različne vrste sladu, s sadnimi in zeliščnimi okusi se najpogosteje uporablja izraz craft pivovarne. Piva, varjena v teh pivovarnah tudi pri nas podobno kot v svetu imenujemo craft piva. V prispevku predstavljamo rezultate senzorične analize craft piv v primerjavi s pivni spodnjega vrenja, ki jih imenujemo ležaki. Senzorično analizo je izvedlo 50 ljubiteljskih poznavalcev piva. Ocenjevalci so senzorično vrednotili vonj, polnost okusa, čistost okusa, kakovost grenčice in rezkost. Vsak od navedenih parametrov je bil vrednoten s točkami od ena do pet po sistemu pozitivnih točk. V oceno smo vključili pet craft in pet piv tipa ležak. Pri pivih tipa ležak so bile ocene dokaj enotne, za razliko od craft piv pri katerih so bila odstopanja večja. Skupna senzorična ocena je bila nekoliko višja pri pivih tipa ležak.

**Ključne besede:** pivo, sensorika, pivovarna, craft pivo.

## **DEVELOPMENT OF CRAFT BREWING IN SLOVENIA AND CHARACTERISTICS OF CRAFT BEERS**

### **ABSTRACT**

The brewing business has a centuries-old tradition in Slovenia. The last decades have been marked by the takeovers of both of our largest breweries by foreign owners on the one hand, and on the other hand, a large increase in newly created smaller breweries. The term craft brewery is most commonly used for smaller breweries that brew beers mainly by top-fermentation technology in addition to using different types of malt with fruit and herbal flavours. Beers brewed in these breweries are called craft beers in Slovenia. In this paper, we present the results of a sensory analysis of craft beers compared to bottom-fermenting beers called lager beers. Sensory analysis was performed by 50 amateur beer connoisseurs. Evaluators sensory evaluated odour, fullness of taste, purity of taste, quality of bitterness, and sharpness. Each of the listed parameters was evaluated with points from one to five according to the system of positive points. We included five craft and five lager-type beers in the evaluation. The ratings were fairly uniform for lager beers, in contrast to craft beers, where the deviations were larger. The overall sensory score was slightly higher for lager beers.

**Key words:** beer, sensory, brewery, craft beer.

# VKLJUČEVANJE KONJ V TURISTIČNO PONUDBO

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### IZVLEČEK

Naš namen je bil ugotoviti pomen vključevanja konj v turistično ponudbo na podeželju v Savinjski dolini in kakšno vlogo imajo pri tem turistične kmetije, ranči, konjeniški centri, klubi in društva. Ugotovitve temeljijo na odgovorih osmih ponudnikov, ki so želeli sodelovati v raziskavi od januarja 2020 do junija 2020. Na osnovi analize smo ugotovili, da je malo turističnih kmetij, ki imajo konje vključene v turistično ponudbo, več je rančev, centrov in klubov. Polovica vprašanih ima toplokrvne pasme konj, 25 % toplokrvne in hladnokrvne, ostali samo hladnokrvne pasme konj. Med pasmami prevladuje slovenska toplokrvna pasma. Konje največ uporabljajo za jahanje v maneži (30 %), najmanj za delo na kmetiji in terapevtsko jahanje. Najpogosteje jih obiskujejo družine z otroci, najmanj pa upokojeni starejši gostje. Več kot polovica (57 %) vprašanih ponudnikov ima ceno za uro s konjem od 20–25 EUR. Pridobili smo tudi 60 odgovorov morebitnih obiskovalcev (spletna anketa), od teh je 57 % pripravljena plačati za uro s konjem 15–20 EUR po osebi, le 22 % bi plačali za uro 20–25 EUR. Najpogosteje (40 %) bi se odločili za jahanje v naravi, le 22 % za jahanje v maneži.

**Ključne besede:** turistična ponudba, rekreacija s konji, anketa, Savinjska dolina.

## **INCLUSION OF HORSES IN THE TOURIST OFFER**

### **ABSTRACT**

Our purpose was to determine the importance of including horses in the tourist offer in the countryside in the Savinjska valley and what role tourist farms, ranches, equestrian centres and clubs as well as societies play in this. The findings are based on the responses of eight providers who were willing to participate in the survey from January 2020 to June 2020. Based on the analysis, we found out that there are only few tourist farms, and more ranches, centres and clubs with horses included in the tourist offer. Half of the respondents have warm-blooded horse breeds, 25% warm-blooded and cold-blooded, the rest only cold-blooded horse breeds. The Slovenian warm-blooded breed predominates among the breeds. Horses are mostly used for riding in the arena (30%), the least for farm work and therapeutic riding. They are most often visited by families with children, and the least by retired elderly guests. More than half (57%) of the surveyed providers set a price for an hour with a horse from EUR 20-25. We also obtained 60 responses from potential visitors (online survey), of which 57% are willing to pay EUR 15-20 per person per hour with a horse, only 22% would pay EUR 20-25 per hour. Most often (40%) they would opt for riding in nature, only 22% for riding in the arena.

**Keywords:** tourist offer, recreation with horses, survey, Savinjska valley.

# ZADOVOLJSTVO DIJAKOV S ŠOLSKO PREHRANO

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## **IZVLEČEK**

Za omenjeni prispevek smo se odločili, da raziščemo, v kakšni meri so dijaki našega Šolskega centra zadovoljni s prehrano, ki jo pripravljamo v lastni šolski kuhinji. To nudimo kot dnevne obroke dijakom, ki so prijavljeni na šolsko prehrano in tistim, ki bivajo v dijaškem domu. Ta deluje v sklopu Šolskega centra. Hkrati smo želeli vključiti dijake v sestavo jedilnikov, da bi bilo zadovoljstvo še boljše. Z nekaj letnim spremljanjem in anketami, ki smo jih izvedli, smo tako izboljšali pestrost jedilnikov in s tem zadovoljstvo dijakov, ki koristijo šolsko prehrano. Tako smo z grafi in tabelami ponazorili primerjavo zadovoljstva skozi pet šolskih let. Stanje smo spremljali od šolskega leta 2016/17, do lanskega 2020/21. Ugotovili smo, da se je stanje zadovoljstva skozi petletno spremljanje res nekoliko izboljšalo. Ker pa se menjajo tako struktura ter navade mladostnikov, pa verjetno nikoli ne bomo ustregli slehernemu dijaku, zato je vedno potrebno vlagati veliko truda, spretnosti in časa, ter prisluhniti mladim, ki imajo veliko energije, novih idej in želja.

**Ključne besede:** dijaki, obrok, anketa, urejenost.

## **STUDENTS' SATISFACTION WITH SCHOOL MEALS**

### **ABSTRACT**

We decided to investigate the extent to which the students of School Center Šentjur are satisfied with the food we prepare in our own school kitchen. We offer the food as daily meals to students who are registered for school meals and to those who live in the student dormitory, which operates within the School center. At the same time, we wanted to include students in the formation of the menus to increase the satisfaction. Through several years of monitoring and surveys that we conducted, we improved the variety of menus and thus the satisfaction of students who benefit from school meals. Thus, we illustrated the comparison of satisfaction over a period of five school years with graphs and tables. We monitored the situation from the school year 2016/17 to 2020/21. The findings state that the degree of satisfaction has indeed improved somewhat during this period. However, as the structure and habits of young people change, we will probably never suit the needs of each and every student, so it is always necessary to invest a lot of effort, skills and time, and to listen to the youth, who has a lot of energy, new ideas and desires.

**Keywords:** students, meal, survey, tidiness.

# OSAMOSVOJITVENE ZGODBE PRI POUKU ZGODOVINE

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## **POVZETEK**

V prispevku predstavljam, kako smo pri urah zgodovine dijakom predstavili osamosvojitve naše države in le-to tudi nadgradili z zgodbami, ki so jih dijaki sami poiskali in zapisali. Gre za zgodbe njihovih domačih, znancev in prijateljev, kako se spominjajo vojne, kaj jih na to spomni itd. Te zgodbe so dijaki predstavili pri urah zgodovine ob koncu šolskega leta, hkrati pa smo jim pripravili tudi gostujočo razstavo ljubiteljskega zbiratelja osamosvojitvenih zgodb, kar smo poimenovali Predmeti in spomini naše vojne. Dijakom smo na ustvarjalen način – s tem, ko so bili sami aktivni – približali znanje o nastanku lastne države, državnih simbolih, hkrati smo poudarili pomen tradicije, slovenskega jezika, narodne zavesti, kulture, umetnosti itd. Pridobljeno znanje dijaki kritično vrednotijo in analizirajo, sklepne misli, ki so jih poustvarili pa so le motivacija za nadaljnje raziskovanje. Ure zgodovine so bile poučne in izredno zanimive.

**Ključne besede:** država, osamosvojitve, predmeti, spomini, vojna.

# INDEPENDENCE STORIES IN THE TEACHING OF HISTORY

## ABSTRACT

This paper describes presentation of attaining our country's independence to students during history lessons and upgrading it with stories that students found and wrote themselves. These are the stories of their families, acquaintances, friends, how they remember the war, what reminds them of it, and so on. These stories were presented by the students in history classes at the end of the school year. At the same time we prepared a guest exhibition of an amateur collector of independence stories, which we named Objects and Memories of Our War. In a creative way – by being active themselves – we brought the students closer to the knowledge of the creation of their own country, national symbols, and at the same time we emphasized the importance of tradition, the Slovenian language, national consciousness, culture, art, etc. The students critically evaluate and analyse the acquired knowledge. The concluding thoughts they recreated are a mere motivation for further research. The history lessons were instructive and extremely interesting.

**Keywords:** country, independence, objects, memories, war.



# HRANA KOT ODPADEK IN NAČINI ZMANJŠEVANJA KOLIČIN ODPADNE HRANE: ETIČNI VIDIK

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## **IZVLEČEK**

Kljub temu, da v svetu in tudi v Sloveniji zavržemo več kot 30 % hrane, so na svetu še vedno lačni ljudje. Različne organizacije po svetu sodelujejo v projektih za zmanjšanje količin odpadne hrane in iščejo rešitve, kako odpraviti lakoto. Razlogi za velike količine zavržene hrane so različni in v članku so predstavljene rešitve, kako to količino na različne načine zmanjšati. Pri tem se moramo zavedati, da pojma presežek pridelane hrane in zavržena hrana ne pomenita istega, hkrati pa tudi, da je veliko odvisno od odnosa potrošnikov. Tega lahko začnemo spreminjati z vzgojo in v izobraževanju, vpliv teh dejavnikov je večji, kot bi si mislili. Razen tega se je treba zavedati dejstva, da svetovno prebivalstvo hitro narašča, kar pomeni, da narašča tudi potreba po količini pridelane hrane, seveda ob zavedanju, koliko hrane je dejansko potrebne dnevno, da se zadosti potrebam. Pri tem je nujno opozoriti na dobrobit živali (oz. na odsotnost te) pri vzreji in še predvsem pri zakolu živine.

**Ključne besede:** zavržena hrana, izgubljena hrana, recikliranje hrane, gospodinjstva, dobrobit živali.

## **FOOD AS WASTE AND WAYS OF REDUCING FOOD WASTE: ETHICAL ASPECT**

### **ABSTRACT**

Despite the fact that we discard more than 30% of food in the world, Slovenia included, there are still people starving. Various organizations around the world are involved in projects to reduce food waste and are looking for solutions to eliminate hunger. The reasons for large amounts of discarded food are different and the article presents solutions on how to reduce this amount in different ways. In doing so, we must be aware that the concepts of food surplus and discarded food do not mean the same thing, but at the same time that much depends on the attitude of consumers. We can start to change this with upbringing and in education, the impact of these factors is greater than one might think. In addition, we must be aware of the fact that the world's population is growing rapidly, which means that the need for the amount of food produced is also growing. Of course, we must take into consideration how much food is actually needed per day to meet nutritional needs. It is necessary to draw attention to the welfare of animals (or the absence of this) in breeding and especially in the slaughter of livestock.

**Key words:** food waste, lost food, food waste recycling, households, animal welfare.

# PRIMERJAVA PREHRANJEVALNIH NAVAD DIJAKOV BC NAKLO V PRIMERJAVI Z MLADOSTNIKI V SLOVENIJI IN EVROPI

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## IZVLEČEK

Šolsko okolje je pomembno tudi z vidika doprinosa k vzpostavitvi in h krepitevi zdravih prehranjevalnih navad. Raziskava je zajemala spremljanje prehranskih navad dijakov Biotehniškega centra Naklo v letih od 2015 do 2020. V povprečju je bilo anketiranih 496 dijakov letno. Izpostavljeni so bili pogostost zajtrkovanja, pogostost uživanja sadja in zelenjave, sladkarij in sladkih gaziranih ter negaziranih pijač. Dobljene rezultate smo primerjali s podatki o prehranskih navadah dijakov prvih in tretjih letnikov srednjih šol v Sloveniji, ki so bili pridobljeni v okviru mednarodne raziskave HBSC v letih 2014 in 2018. Dijaki Biotehniškega centra manj redno zajtrkujejo, uživajo manj sadja in zelenjave, več sladkih prigrizkov, več brezalkoholnih gaziranih pijač in nekoliko manj brezalkoholnih negaziranih pijač. Zbrane podatke smo primerjali s podatki prehranskih navad med mladostniki v Evropi.

**Ključne besede:** prehranjevalne navade, mladostnik, šolska prehrana.

# **EATING HABITS AMONG STUDENTS BC NAKLO IN COMPARISON WITH ADOLESCENTS IN SLOVENIA AND EUROPE**

## **ABSTRACT**

The school environment is also important in terms of helping to establish and reinforce healthy eating habits. The survey monitored the eating habits of students at Biotechnical Centre Naklo from 2015 to 2020. On average, 496 students were surveyed annually. The frequency of breakfast, fruit and vegetables, sweets and sugary carbonated and non-carbonated beverages was monitored. The results were compared with data on the dietary habits of first- and third-year students in secondary schools in Slovenia, which were obtained in the context of the HBSC international survey in 2014 and 2018. Students of the Biotechnical Centre have less regular breakfast, consume less fruit and vegetables, more sugary snacks, more non-alcoholic carbonated drinks and slightly less non-alcoholic non-carbonated drinks. The data collected were compared with data on dietary habits among adolescents in Europe.

**Keywords:** eating habits, school meal, adolescent.

# DVIG JEZIKOVNIH SPRETNOSTI IN DEDIŠČINSKI TURIZEM KOT MOTIVACIJSKA DEJAVNIKA ZA ŠTUDIJSKO PRAKSO V TUJINI

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## IZVLEČEK

Med študijsko prakso v tujini študenti pridobijo strokovna in praktična znanja, se učijo jezikov in razvijajo kulturno zavest. Namen prispevka je ugotoviti kako študenti ocenjujejo prednosti prakse v tujini s poudarkom na pomenu dviga jezikovnih spretnosti ter možnosti raziskovanja dediščine dežele gostiteljice. Študenti z opravljanjem obvezne jezikovne ocene s Spletno jezikovno podporo ocenijo svoje znanje, s ponovnim ocenjevanjem ob vrnitvi domov pa pridobijo podatek o napredku. Z uporabo spletnega jezikovnega tečaja in rabo jezika v povprečju izboljšajo svoje znanje za vsaj eno stopnjo CEFR. V rezultatih ankete, ki je vključevala 56 študentov ŠC Šentjur, so le ti opredelili dvig jezikovnih spretnosti kot zelo/dokaj pomemben rezultat mobilnosti v 97 %. Med mobilnostjo so v vlogi turistov motiviranih k ogledu naravne in kulturne dediščine v stiku z lokalnim prebivalstvom in tujimi študenti, ki raziskujejo deželo gostiteljico in razvijajo medkulturne kompetence. Anketiranci so odkrivanje lepot in znamenitosti dežele gostiteljice kar v 95 % označili kot zelo/dokaj pomemben pričakovani rezultat mobilnosti.

**Ključne besede:** Erasmus+ mobilnost, praktično izobraževanje, Spletna jezikovna podpora, naravna in kulturna dediščina.

## **IMPROVEMENT OF LANGUAGE SKILLS AND HERITAGE TOURISM AS MOTIVATING FACTORS FOR PRACTICAL TRAINING ABROAD**

### **ABSTRACT**

During practical training abroad, students acquire professional and practical knowledge, learn languages, and develop cultural awareness. The purpose of this paper is to determine how students assess the benefits of going abroad with an emphasis on the importance of improving language skills and the chance of researching the heritage of the country. Students assess their knowledge by a language assessment with OLS. They gain feedback on their progress by their language skills reassessment upon their return. By participating in an online language course and regular language use they improve fluency by at least one CEFR level on average. A survey which included 56 students at School Center Šentjur showed that 97% of respondents saw the increase in language skills as a very/quite important result of Erasmus+. During mobility, in their role of tourists, they are motivated to visit the natural and cultural heritage, interact with locals and foreign students who explore the country and develop intercultural skills. As many as 95% of respondents saw the exploration of the country's heritage as a very/rather important result of the mobility.

**Keywords:** Erasmus + mobility, practical training, Online language support, natural and cultural heritage.

# DIJAKI S POSEBNIMI POTREBAMI NA ŠOLSLEM CENTRU ŠENTJUR, SREDNJI POKLICNI IN STROKOVNI ŠOLI

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## IZVLEČEK

Vzgoja in izobraževanje otrok s posebnimi potrebami temeljita na načelih enakih možnosti za zagotavljanje najboljšega razvoja posameznega otroka. V Sloveniji sta organizirana kot javna služba in sicer v javnih vrtcih, šolah ter v specializiranih javnih šolah oziroma zavodih. Cilj tega prispevka je bil, ugotoviti ali se na Šolskem centru Šentjur, Srednji poklicni in strokovni šoli število dijakov s posebnimi potrebami v obdobju 12 let res povečuje. Namen je bil ugotoviti, v katerih izobraževalnih programih je dijakov s posebnimi potrebami največ in katere kategorije prevladujejo. Ugotovili smo, da se v zadnjih petih letih število dijakov s posebnimi potrebami res povečuje, vendar procentualno bistvenih odstopanj ni. Na Šolskem centru Šentjur se namreč v zadnjih treh letih povečuje tudi število vpisanih dijakov. Največ dijakov s posebnimi potrebami je vključenih v srednje poklicno izobraževanje, v zadnjih letih pa se povečuje število dijakov, vključenih v srednje strokovno in poklicno tehniško izobraževanje. Ugotovili smo tudi, da do šolskega leta 2018/19 ni bil na šolo vpisan noben dijak s čustvenimi in vedenjskimi motnjami ter noben dijak z avtističnimi motnjami. Skozi vsa leta je najbolj številčno zastopana skupina dijakov s primanjkljaji na posameznih področjih učenja.

**Ključne besede:** dijaki s posebnimi potrebami, izobraževanje s prilagojenim izvajanjem in dodatno strokovno pomočjo, prilagoditve, motnje, individualizirani načrt, srednja šola.

## **STUDENTS WITH SPECIAL NEEDS AT SCHOOL CENTER ŠENTJUR, VOCATIONAL AND TECHNICAL SECONDARY SCHOOL**

### **ABSTRACT**

The education of children with special needs is based on the principles of equal opportunities to ensure the best development of each child. In Slovenia they are organised as public services in public kindergartens, schools and in specialised public schools or institutions. The aim of this contribution was to determine whether the number of students with special needs is indeed increasing over a period of 12 years at School center Šentjur, Vocational and technical secondary school. The aim was to identify which educational programmes have the highest number of students with special needs and which categories prevail. We have found that the number of students with special needs has indeed increased in the last five years, but there are no significant deviations. In the last three years, the number of enrolled students has also increased at School center Šentjur. Most students with special needs have been enrolled in our upper secondary vocational education program, while in recent years the number of students enrolled in secondary vocational and technical education has increased. We also found that no students with emotional and behavioural disorders and no students with autistic disorders had enrolled in the school until the school year 2018/19. Over the years, the most represented group of students with special needs, were students with deficits in individual fields of learning.

**Keywords:** students with special needs, education with adapted implementation and additional professional assistance, adjustments, individualized plan, secondary school.



# DOŽIVLJANJE IZOBRAŽEVANJA NA DALJAVO MED DIJAKI RAZLIČNIH LETNIKOV/PROGRAMOV V BIOTEHNIŠKEM IZOBRAŽEVANJU

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## **POVZETEK**

Z razglasitvijo epidemije v začetku marca 2020, so se v Sloveniji uvedli številni ukrepi za zajezitev širjenja virusa SARS-CoV-2. V skladu z ukrepi so se zaprle tudi vzgojno-izobraževalne institucije, kar je zaposlenim in učečim predstavljalo velik izziv in stres. Hiter prehod iz ustaljenega načina dela, na izobraževanje (poučevanje/učenje) na daljavo, je udeležence prisilil, da so se morali takoj navaditi na nov način dela. Klasičen pouk je zamenjala informacijsko-komunikacijska tehnologija (IKT), kar je večini udeležencev na začetku predstavljalo težave. Doživljanje pouka na daljavo sem pri dijakih Šolskega centra Šentjur preverjala s pomočjo spletnega vprašalnika v več kategorijah, ki ga je rešilo skupno 159 dijakov Srednjega strokovnega (SSI) in Poklicno-tehniškega izobraževanja (PTI). Osredotočila sem se na doživljanje in potek pouka na daljavo, doživljanje odnosa z učiteljem in doživljanje odnosa s prijatelji/sošolci.

**Ključne besede:** pouk/učenje na daljavo, SARS-CoV-2, stres, motivacija, IKT.

# **EXPERIENCE OF DISTANCE LEARNING AMONG STUDENTS OF DIFFERENT CLASSES/PROGRAMS IN BIOTECHNICAL EDUCATION**

## **ABSTRACT**

With declaration of epidemics in the beginning of March 2020, Slovenia implemented numerous measures for containment of SARS-CoV-2 virus. In accordance with these measures, educational institutions closed as well, which represented great challenge and stress to both employees and learners. Quick transition from the establish way of work, to distance education (teaching/learning) forced the partakers to get used to the new way of work immediately. Classical educational course was replaced by information and communication technology (ICT), which, at least at the beginning, presented problems to most partakers. I have been observing how students of the School centre Šentjur are experiencing the distance education with the help of the online questionnaire with several categories, which was answered by 159 students of the upper secondary technical education and vocational-technical education. My focus was on the experiencing and course of the distance learning, experiencing of the relationship with the teacher and experiencing of relationships among friends/classmates.

**Keywords:** distance learning, SARS-CoV-2, stress, motivation, ICT.

# KOMUNIKACIJSKI IZZIVI PRI IZREDNIH ŠTUDENTIH V PROGRAMIH PREHRANSKE VERIGE

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## **IZVLEČEK**

Z izzivi v komuniciranju pri izobraževanju izrednih študentov se sooča vsaka Višja strokovna šola, ki izvaja programe za izobraževanje izrednih študentov. V prispevku bomo predstavili razlike med izvajanjem rednega in izrednega študija ter prilagajanje izobraževanja za izredne študente. Višja strokovna šola načrtuje prilagoditve za izvajanje izrednega študija ter jih nato prilagodi po uvodnem sestanku s študenti. Izredni študenti so velikokrat že zaposleni in želijo z višjo stopnjo izobrazbe, ki jo bodo pridobili po zaključeni diplomi na svojem delovnem mestu napredovati ali pa je višja stopnja izobrazbe tudi pogoj za opravljanje dela na delovnem mestu, ki ga že zasedajo. Študenti, ki so zaposleni in opravljajo delo, ki ni v skladu z njihovo smerjo srednješolske izobrazbe imajo veliko znanja ter praktičnih izkušenj, ki pa jih želijo potrditi še z formalno izobrazbo določene smeri. V prispevku bo predstavljen vpis v izredni študij na Šolskem centru Šentjur v programih prehranske verige, glede na srednješolsko izobrazbo študentov.

**Ključne besede:** izobraževanje, izredni študij, vpis, prilagoditve, komunikacija.

# COMMUNICATION CHALLENGES FOR PART-TIME STUDENTS IN PROGRAMS OF THE FOOD SUPPLY CHAIN

## ABSTRACT

Short-cycle higher vocational colleges that implement part-time educational programs face challenges in communicating in the education of part-time students. In this paper, we will present the differences between the implementation of full-time and part-time studies and the adaptation of education for part-time students. The Higher Vocational College plans adjustments to conduct part-time studies and then adjusts them after an introductory meeting with students. Part-time students are often already employed and want to advance in their workplace with a higher level of education that they will obtain after graduation; moreover, a higher level of education might also be a condition for performing the job they already hold. Students who are employed and perform work that is not in line with their field of secondary education have a wealth of knowledge and practical experience, which they want to upgrade with a formal education in a particular field. The paper will present the enrollment in part-time studies at the School Center Šentjur in the food supply chain programs, according to the secondary education of students.

**Keywords:** education, part-time studies, enrollment, adjustments, communication.

# **APLIKATIVNA UPORABA STROKOVNE INFORMATIKE NA PODROČJU KMETIJSTVA**

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## **IZVLEČEK**

Vsakomur predstavlja izziv biti čim boljši v svoji dejavnosti. K temu pripomore veliko znanja, izkušenj... pa tudi dobra informiranost in iznajdljivost v določenih situacijah. Tudi na področju kmetijstva je pomembno, da spremljamo novosti in preko spleta sledimo novim trendom. Študentje v programu Upravljanje kmetijstva in krajine pri predmetu Strokovna informatika in statistične metode vrednotenja spoznajo pomembna spletišča, spletna orodja, portale in platforme, ki nudijo podporo pri urejanju administrativnih zadev, imajo pa tudi dodano praktično vrednost. Pri vajah se tako srečamo s Kaliopo – portalom iObčina, portalom e-Sodstvo, eUprava in drugimi, ki omogočajo vpogled katastrske in zemljiškoknjizne podatke. Naučimo se poiskati in uporabiti relevantne statistične podatke s podatkovnih baz SiStat in FAOSTAT.

**Ključne besede:** spletišče, spletni portal, baza podatkov.

## **APPLIED USE OF PROFESSIONAL INFORMATICS IN THE FIELD OF AGRICULTURE**

### **ABSTRACT**

There is a challenge for everyone to be the best they can in their activities. A lot of knowledge and experience contributes to this, as well as being well informed and ingenious in certain situations. In the field of agriculture, it is also important to follow innovations and new trends online. Students in Countryside and Landscape Management Programme in the Professional Informatics and Statistical Valuation Methods course learn about important websites, web tools, portals and platforms that offer support in arranging administrative matters, and previously mentioned tools also have practical value. When practical classes such as exercises take place, we use Kaliopa - the iMunicipality portal, the e-Justice, the eGovernment portal and others, which provide insight into cadastral and land registry data. We learn to find and use relevant statistics from SiStat and FAOSTAT databases.

**Keywords:** website, web portal, database.

## PRIMERA DOBRE PRAKSE PRI POUČEVANJU ANGLEŠČINE V SREDNJI ŠOLI

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### IZVLEČEK

V primerjavi s prejšnjimi desetletji se v šolah število dijakov in dijakinj z odločbo o usmerjanju povečuje. Izjemno pomembno je, da se tudi učitelj v oddelku z dijakom s posebnimi potrebami nenehno izobražuje, se razvija in išče nova znanja, s katerimi lahko bolje pomaga dijaku. V članku sta predstavljena primera dobrih praks pri poučevanju dijaka z motnjami pozornosti in dijaka z disleksijo. V prvem primeru so predstavljene smernice, ki so bile upoštevane z namenom doseganja boljših rezultatov, v drugem pa konkretne rešitve, kako dijaku z disleksijo olajšati učenje in pomnjenje. V obeh primerih gre za poučevanje angleškega jezika v srednji šoli.

**Ključne besede:** izobraževanje, motnje pozornosti, disleksija, primeri dobre prakse.

## **EXAMPLES OF GOOD PRACTICE IN TEACHING ENGLISH IN SECONDARY SCHOOL**

### **ABSTRACT**

Compared to previous decades, the number of students with the decision on guidance in schools is increasing. It is extremely important that the teacher in the class with a student with special needs is constantly educated, developed and seeks new knowledge that can better help the student. The article presents examples of good practice in teaching a student with ADHD and a student with dyslexia. In the first case, guidelines are presented that have been followed in order to achieve better results, and in the second case, concrete solutions on how to facilitate learning and memory for a student with dyslexia. In both cases, it is about teaching English in high school.

**Key words:** education, attention deficit disorder, dyslexia, examples of good practice.



# ZNAČILNOSTI GOVORA V OBDOBJU ZGODNJEGA OTROŠTVA

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## **IZVLEČEK**

V prispevku Značilnosti govora v zgodnjem otroštvu so predstavljeni temeljni koncepti, in sicer sporazumevanje, njegove značilnosti in dejavniki, ki nanj vplivajo, ter značilnosti govora otrok v izbranem obdobju. Področja razvoja govora in govorne sposobnosti pa so v veliki meri odvisna od medsebojnih interakcij oz. drugače povedano: brez ljudi (govorečega okolja) se otrok ne nauči govoriti, kar v skrajnem primeru pomeni, da bi bil otrok, ki ne bi živel v družbi in se torej ne bi nikoli vključeval v interakcije z drugimi govorečimi ljudmi, nezmožen govora. Kot primer navajam govor vzgojiteljice v vrtcu. Iz vzgojiteljičinega govora je razvidna pogosta raba pogovornega jezika, predvsem redukcija samoglasnikov, najpogosteje v glagolih, pa tudi v prislovih, veznikih, zaimkih in naklonskem izrazu.

**Ključne besede:** sporazumevanje, sporočanje, govor otrok, vzgojiteljica, metajezikovne zmožnosti

## **SPEAKING CHARACTERISTIC OF EARLIER CHILDHOOD**

### **ABSTRACT**

My thesis Speaking characteristic of earlier childhood basic concepts of speech, namely factors and characteristic affecting communication with kids, children's language in the selected period. Areas of speech development and speech skills are highly dependent of mutual interactions or in other words: without people (speaking environment) a child does not learn how to speak, what in an extreme case means that the child who wouldn't live in society and would never get involved in interactions with other people, would be unable to speak. As an example I quote a teacher of preschool education. From the records frequent use of colloquial language is evident, especially reduction of vowels, most often in verbs, as well as in adverbs, conjunctions, pronouns, and the slope term

**Keywords:** children, communication, messaging, children speech, teacher of preschool education, metalinguistic abilities.

# IZKUŠNJA ŠTUDENTOV S PRAKSO NA DALJAVO NA RAZREDNI STOPNJI

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## IZVLEČEK

V času epidemije je pouk na vseh osnovnih šolah v Republiki Sloveniji potekal na daljavo, zato so študentje strnjeno pedagoško prakso opravljali na daljavo. Namen raziskave je bil pridobiti mnenje študentov glede sodelovanja in odnosa z mentorjem v času prakse na daljavo in njihove izkušnje glede prakse na daljavo. V raziskavo so bili zajeti študentje, ki so v študijskem letu 2019/20 obiskovali 4. letnik 1. stopnje študijske smeri Razredni pouk na Univerzi v Mariboru in Univerzi v Ljubljani. Pri raziskovalnem delu smo uporabili deskriptivno in kavzalno-eksperimentalno metodo pedagoškega raziskovanja. Ugotovili smo, da je večina študentov, ki so z mentorjem imeli neformalen odnos, mnenja, da je mentorju bila v pomoč, med študenti, ki so pa z mentorjem imeli formalen odnos, pa je ta delež nižji. Študentje, ki so z mentorjem imeli formalen odnos, so v večji meri pogrešali več komunikacije in več povratnih informacij v primerjavi s tistimi, ki so imeli neformalen odnos. Za večino študentov je praksa na daljavo bila pozitivna izkušnja kar se tiče sodelovanja z mentorjem. Ugotovili smo, da so študentje obeh fakultet pretežno strinjali s tem, da je praksa na daljavo bila koristna.

**Ključne besede:** pedagoška praksa, mentorstvo, pouk na daljavo, razredni pouk, epidemija, covid-19 (SARS-CoV-2).

## **EXPERIENCES OF TRAINEE LOWER PRIMARY SCHOOL TEACHERS WITH ONLINE SCHOOL**

### **ABSTRACT**

In the time of epidemics, the classes at all primary schools in Slovenia went online, which is why trainee teachers had to take their school practice online as well. The aim of the research was to obtain thoughts of student teachers regarding the cooperation with their mentors while teaching online and about online teaching as such. The research involved students who were in the 4<sup>th</sup> year of their studies in 2019/2020 school year in program Elementary Education at University of Maribor and University of Ljubljana. The research methods used were descriptive and causal-experimental method of pedagogic research. The study finds that most of those students who had a non-formal relationship with their mentors thought they helped their mentors at their work. Those who had a more formal relationship mostly wished for more communication and feedback when compared to the first group. The research finds online school practice was a positive experience of working with a mentor. Further analysis showed that most students of both universities agree their practice was useful, despite the circumstances.

**Keywords:** school practice, mentorship, online school, lower primary school, epidemic, COVID-19 (SARS-CoV-2).

# POUČEVANJE GOSPODINJSTVA V OSNOVNI ŠOLI NA DALJAVO

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## **IZVLEČEK**

Skozi zgodovino poučevanja in učenja so se vsebine in ugled predmeta gospodinjstvo spreminjali. Danes je zasnova predmeta sodobneje orientirana. Predmet zajema tako naravoslovne kot družboslovne vsebine, ki so tesno povezane z življenjem posameznika v družbi in se prepletajo z mnogimi področji našega življenja. Moduli, ki sestavljajo učni načrt za gospodinjstvo, so Ekonomika gospodinjstva, Tekstil in oblačenje, Bivanje in okolje ter Hrana in prehrana. V današnjem času v poučevanje nezadržno vstopa informacijsko-komunikacijska tehnologija, ki ponuja veliko informacij, ki jih posameznik oblikuje v znanje, omogoča pa tudi drugačen pristop v procesu poučevanja. Učenje na daljavo je nadzorovano samoizobraževanje, ki zahteva spremembe zlasti v metodologiji poučevanja. Pomembno je, da je delo na daljavo ustrezno didaktično zasnovano, da ima ustrezno zastavljene učne cilje, s katerimi učitelj seznanjeni tudi učence. Za doseganje izobraževalnega cilja je pomembna visoka motiviranost učenca za posamezno učno vsebino. Opisani so primeri dejavnosti pri pouku gospodinjstva v 6. razredu, ki so bile izvedene na daljavo v orodju OneNote ClassNotebook.

**Ključne besede:** gospodinjstvo, delo na daljavo, informacijsko-komunikacijska tehnologija, OneNote.

## **DISTANCE TEACHING OF HOME ECONOMICS IN PRIMARY SCHOOL**

### **ABSTRACT**

Throughout the history of teaching and learning, the content and reputation of the home economics subject have changed. Today, the design of the subject is more modern. The course covers both natural and social sciences, which are closely related to the life of the individual in society and are intertwined with many areas of our lives. The modules that make up the home economics curriculum are home economics, textiles and clothing, home and the environment, and food and nutrition. Nowadays, information and communications technology are irresistibly entering teaching, which offers a lot of information that an individual forms into knowledge, but also enables a different approach in the teaching process. Distance learning is a diverse, focused and controlled self-education that requires changes especially in the teaching methodology. It is important that distance work is properly didactically designed, that it has properly set learning goals. Student motivation for individual learning content is important for achieving the educational goal. Examples of 6th grade home economics activities that were carried out remotely in OneNote ClassNotebook are described.

**Keywords:** home economics, distance teaching, information and communications technology, OneNote.

# OBRAVNAVA UČNE VSEBINE SKRBIM ZA ZDRAVJE S POMOČJO SPLETNEGA OKOLJA CANVA V 2. RAZREDU OSNOVNE ŠOLE

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## IZVLEČEK

Za otrokov psihofizični razvoj je najpomembneje, da je ozaveščen o zdravi prehrani in da jo čim bolj vnaša v svoj jedilnik. Težava današnjega načina življenja je predvsem pomanjkanje časa in preobremenjenost staršev, kar vodi do slabih prehranjevalnih vzorcev v družini. Današnji način življenja iz otrok dela pretežno sedeča bitja.

Kot učiteljica razrednega pouka se zavedam, da učitelji igramo ključno vlogo pri ozaveščanju otrok o zdravem načinu življenja, ki je še posebej pomembna v prvem starostnem obdobju šolanja. Tako učitelj oblikuje miselne in vedenjske vzorce otrok, ki so kasneje povezani z redno gibalno/športno aktivnostjo in zdravim načinom življenja. Na drugi strani je informacijska tehnologija, ki je nepogrešljiv del našega vsakdana, tudi pri mlajših učencih, ki jo večinoma uporabljajo kot popestritev. Namen prispevka je združiti skrb za zdravje z informacijsko komunikacijsko tehnologijo (v nadaljevanju IKT), ki je pogosto razlog, da so otroci manj aktivni in imajo slabše prehranjevalne navade ter s primerom dobre rabe prikazati, da je lahko IKT odlično orodje za spodbujanje zdravega načina življenja pri učencih. Učenci so pri pouku spoznavanja okolja pripravili zdrave malice in njihove recepte oblikovali v knjižico receptov s pomočjo orodja Canva. Odmore smo izkoristili za gibanje, ki so prav tako opisani v prispevku. S takšnim načinom dela smo ugotovili, da lahko IKT pozitivno vpliva na otrokov odnos do gibanja in zdravega načina življenja, pomembno pa je, da ga učitelj uporabi premišljeno in dobro načrtovano.

**Ključne besede:** skrb za zdravje, spoznavanje okolja, zdrav obrok, aktivni odmor, informacijsko komunikacijska tehnologija (IKT), Canva.

# **DISCUSSION ABOUT LEARNING CONTENT "I CARE ABOUT HEALTH" WITH THE HELP OF THE ONLINE ENVIRONMENT CANVA IN THE 2ND GRADE OF PRIMARY SCHOOL**

## **ABSTRACT**

The most important thing for a child's psychophysical development is to be aware of a healthy diet and to include it to his menu as much as possible. The problem of today's lifestyle is mainly the lack of time and overburdening parents, which leads to poor eating patterns in the family. Today's lifestyle makes children mostly sedentary creatures. Children spends at least four hours a day at school. As a classroom teacher, I am aware that teachers play a key role in raising children's awareness of a healthy lifestyle, which is especially important in the first age of schooling. Thus, the teacher forms the mental and behavioral patterns of children, which are later associated with regular physical activity / sports and a healthy lifestyle.

On the other hand, information technology, which is an indispensable part of our daily lives, is also used by younger students and is mostly used as a diversification.

The purpose of this article is to combine care for health with ICT, which is often the reason why pupils are less active and have poor eating habits and to show with an example of good use that ICT can be a great tool for promoting healthy lifestyles. During the learning session pupils prepared healthy snacks and designed their recipes into a recipe book with help of the Canva tool. We took advantage of the breaks for sport activities which are also described in this article. With this way of working, we found that ICT can have positive effect on a child's attitude towards exercise and a healthy lifestyle and it is also important that the teacher uses it thoughtfully and well planned.

**Keywords:** care for health, knowledge of the environment, healthy meal, active break, information and communication technology (ICT), Canva.



## SMISELNOST UPORABE PREHRANSKIH DOPOLNIL PRI ŠPORTNIKIH

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### IZVLEČEK

Prehranska dopolnila pogosto dopolnjujejo redno prehrano športnikov. Kako pogosto, zakaj in katera prehranska dopolnila uživajo rokometiši ter kakšne so njihove prehranske navade, smo proučevali s pomočjo anketiranja. Na anketna vprašanja je odgovarjalo 60 rokometišev, 30 iz 1. in 30 iz 2. slovenske članske lige. Ugotovili smo, da igralci 1. slovenske lige pogosteje posegajo po beljakovinskih dopolnilih in uživanju beljakovin z redno prehrano kot igralci 2. slovenske lige, s čimer zadovoljijo potrebo po zadostnem vnosu beljakovin na dan, medtem ko igralci 2. slovenske lige te potrebe ne zadovoljijo. Ta razlika vnosa beljakovin med igralci 1. in 2. slovenske lige se na koncu lahko kaže v boljši regeneraciji igralcev 1. lige in posledično manjši možnosti poškodb. Na osnovi analize prehranskih navad oz. uživanja beljakovinskih živil lahko sklepamo, da bi rokometiši lahko povečali vnos beljakovin s povečano količino užitega mesa, sira, stročnic in sirotke, ki je dejansko večina ne pozna oz. je ne uživa. Zato predlagamo učinkovito promocijo uživanja klasičnih beljakovinskih živil ter sirotke kot napitka pri vseh športnikih.

**Ključne besede:** prehranska dopolnila, uravnotežena prehrana, rokometiš, beljakovinska živila.

## **MEANINGFULNESS OF USING DIETARY SUPPLEMENTS IN ATHLETES**

### **ABSTRACT**

Dietary supplements often complete the regular diet of athletes. We conducted a survey and studied how often, why, and which dietary supplements handball players consume the most, and what their eating habits are. Sixty handball players, 30 from the 1st and 30 from the 2nd Slovenian handball league, answered the survey questionnaire. We found that players in the 1st league are more likely to resort to protein supplements and protein intake with a regular diet than players in the 2nd league, thus satisfying the need for sufficient daily protein intake, while players in the 2nd league do not satisfy this need. This difference in protein intake between the players of the 1st and 2nd leagues can ultimately be reflected in better regeneration of the players in the 1st league and consequently less risk for possible injuries. Based on the analysis of eating habits and consumption of protein foods, we can conclude that handball players could increase their protein intake by increasing the consumption of meat, cheese, legumes, and whey, the latter of which in fact, most of the athletes are not familiar with or do not consume. Therefore, we propose an effective promotion of the consumption of classic protein foods and whey as a beverage for all athletes.

**Keywords:** dietary supplements, balanced diet, handball player, protein foods.

## **SKUPINE ŽIVIL V PREHRANJEVALNI PIRAMIDI TER POZNAVANJE LE-TEH**

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### **IZVLEČEK**

V članku si bomo pogloblje pogledali pomen prehranjevalne piramide ter skupine živil, ki jih najdemo v njej. To so štiri skupine živil in sicer škrobna živila, sadje in zelenjava, mleko in mlečni izdelki, meso, ribe, jajca, stročnice in maščobe in olja. Vse skupine živil sem v članku predstavila.

Namen članka je, da z anketo med učenci 5. razreda ugotovim, kako dobro poznajo skupine živil v prehranjevalni piramidi ter ali vedo, katero živilo spada v določeno skupino.

**Ključne besede:** učenci razrednega pouka, prehranjevalna piramida, skupine živil, zdrava prehrana.

## **FOOD GROUPS IN THE FOOD PYRAMID AND THE KNOWLEDGE ABOUT THEM**

### **ABSTRACT**

This article focuses on the food pyramid and food groups, which it consists of. There are four food groups; fibre, fruit, vegetables, milk and dairy products, meat, fish, eggs, fabale and fat. Each group is presented in the article.

The aim of the article is to research how well 5<sup>th</sup> graders know about food groups in the food pyramid and whether they know which food belongs to certain food group.

**Keywords:** primary school pupils, food pyramid, food groups, healthy diet

# POZNAVANJE IN DELITEV SADJA TER VKLJUČEVANJE V PRAKTIČNE VAJE PRI POUKU GOSPODINJSTVA

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## IZVLEČEK

V članku bom predstavila poznavanje in vrste sadja ter vključevanje le-tega v praktične vaje pri pouku gospodinjstva. Namen raziskave je, da z anketo med učenci 6. razreda ugotovim, koliko poznajo sadje in kako ga uvrščajo v skupine. V anketi je sodelovalo 35 učencev. Vsi učenci so prepoznali limono, ananas, banano, hruško, jabolko, grozdje in jagodo. 34 učencev (97,1 %) je prepoznalo češnjo in kivi, pomarančo 94,3 % učencev, malino 91,4 %, borovnico in slivo 80 %, kostanj 85 %, granatno jabolko in avokado 29 učencev (82,9 %). Mango je prepoznalo 74,3 % učencev, smokvo 65,7 %, lešnik in breskev 57,1 %, pistacijo 51,4 %, ribez 42,9 %, šipek 25,7 % učencev. Le dva učenca sta prepoznala kutino in papajo. Največ učencev (40 %) ni prepoznalo lešnika, breskve (31,4 %), kutine (28,6 %) in manga (22,9 %). Pri papaji je bilo 88,6 % učencev brez odgovora, pri šipku 68,6 %, kutini 65,7 %, ribezu 45,7 %, pistaciji 31,4 % in smokvi 25,7 %. Pri ostalih vrstah sadja je ostal le kakšen prazen prostor za odgovor. Pri uvrščanju sadja v skupine so bili učenci najbolj uspešni pri koščičastem sadju, najmanj pa pri tropskem in južnem sadju.

**Ključne besede:** sadje, vrste sadja, izdelki iz sadja, zdrava prehrana.

# **THE KNOWLEDGE AND DISTRIBUTION OF FRUIT AND THE INTEGRATION OF FRUIT INTO PRACTICAL WORK IN HOME ECONOMICS CLASSES**

## **ABSTRACT**

This article presents fruit, types of fruit and integration of fruit into practical work in home economics classes. The aim of the research is to establish how well pupils in Class 6 know about fruit and whether they can classify it into groups. 35 pupils participated in the questionnaire. They all recognised a lemon, pineapple, pear, apple, strawberry and grapes. 34 pupils (97,1 %) recognised a cherry and kiwi, an orange 94,3 % of pupils, a raspberry 91,4 %, a blueberry and plum 80 %, a chestnut 85 %, a pomegranate apple and avocado 29 pupils (82,9 %). 74,3 % of pupils recognised a mango, a fig 65,7 % of pupils, a hazelnut and peach 57,1 %, pistachio 51,4 %, a currant 42,9 %, a dog rose 25,7 % of pupils. Only two pupils recognised a quince and papaya. A lot of pupils didn't recognise (40 %) a hazelnut, a peach (31,4 %), a quince (28,6 %) and a mango (22,9 %). 88,6 % of pupils didn't answer a question on papaya, 68,6 % about a dog rose, 65,7 % about a quince, 45,7 % a currant, 31,4 % pistachio and 25,7 % a fig. Pupils were more successful when classifying stone fruit and less with tropical fruit.

**Keywords:** fruit, types of fruit, fruit products, healthy diet.

## TRIHINELOZA

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### IZVLEČEK

Trihinelozna je zoonoza, ki jo povzročajo paraziti iz rodu *Trichinella spp.* Pri človeku je najpogostejša okužba z vrsto *Trichinella spiralis*. Vir okužbe za človeka predstavlja predvsem surovo, sušeno, prekajeno ali termično nezadostno obdelano meso domačih prašičev, kopitarjev in divjadi, ki je kontaminirano z razvojnimi oblikami trihinele. Bolezen trihinelozna pri človeku lahko poteka asimptomatsko ali pa z značilnimi bolezenskimi znaki (akutni generalizirani miozitis), ki lahko vodijo tudi v smrt. Število primerov okužb po svetu sicer ni veliko, kar verjetno lahko pripisujemo rednemu veterinarsko - sanitarnemu nadzoru klavnih živali in mesa ter dodatnim ukrepom, ki zmanjšujejo možnost prenosa okužbe (zadostna toplotna obdelava in zamrzovanje mesa). Evropska zakonodaja določa, da se v klavnici odvzame vzorec na prisotnost trihinele vsakemu prašiču, katerega meso je namenjeno prehrani ljudi. Ob pozitivnem rezultatu preiskave je meso takšne živali zdravstveno neustrezno. Zadnji primer trihineloze pri domačem prašiču je bil potrjen leta 1989, vendar ta prašič ni izviral iz Republike Slovenije.

**Ključne besede:** trihinelozna, okužba, *Trichinella spiralis*.

## TRICHINELOSIS

### ABSTRACT

Trichinellosis is zoonosis, caused by parasites from genus *Trichinella spp.* In humans, the most common infection is with a species *Trichinella spiralis*. The source of the infection for humans is especially raw, dried, smoked or undercooked meat of domestic pigs, ungulates and game, contaminated with development stages of trichinella. In humans, the disease Trichinellosis can be asymptomatic or it can display characteristic signs of illness (acute myositis), which can lead to death. The number of cases around the world is low, which can probably be attributed to regular veterinary and sanitary supervision over animals for slaughter and meat and additional measures, taken to reduce the chance of transmission of the infection (sufficient heat treatment and freezing of meat). The European legislation stipulates taking of sample for testing of a presence of *Trichinella* at the slaughterhouse, from every pig, the meat of which is intended for human consumption. If positive, the meat of such animal is considered to be unsuitable from a health aspect. The last Trichinellosis case in domestic pig was confirmed in 1989, where the pig did not originate from the Republic of Slovenia.

**Key words:** trichinellosis, infection, *Trichinella spiralis*.



# IZZIVI SODOBNEGA POTROŠNIKA

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## IZVLEČEK

V raziskovalni nalogi se osredotočam na izbiro zdrave hrane. Menim, da se daje premalo pozornosti motilcem hormonov in povzročiteljem vnetij, ki jih najdemo v hrani in da smo potrošniki slepo vodeni pri nakupih, saj ne razumemo celotne matrice pridelave in predelave hrane. Izhajam iz predpostavke, da so to skupine, katere so lahko eden glavnih krivcev za množičen razcvet sodobnih kroničnih bolezni. Na trgovinskih policah je iz dneva v dan večja ponudba prehranskih izdelkov. Ob tem se sprašujem:

- kako prepoznati zdravo hrano;
- kakšna je pri tem vloga potrošnika v tripartitnem odnosu z državo in pridelovalci;
- koliko znanja ima potrošnik na tem področju?

V iskanju odgovorov sem se osredotočila na raziskovanje zakonodaje na tem področju, intervjuvala sem Andrejo Bizjak, zaposleno na Upravi Republike Slovenije za varno hrano, veterinarstvo in varstvo rastlin ter naredila anketo, v kateri sem raziskovala izobraženost ter izzive sodobnega potrošnika. Ugotavljam, da je potrošnik kljub vsem pravilnikom in zakonom, ki urejajo področje prehrane, v veliki meri prepuščen sam sebi. Čas je, da se začnemo izobraževati ter postanemo odgovorni in zavedni potrošniki.

**Ključne besede:** zdrava hrana, potrošnik, pesticidi, gensko spremenjeni organizmi, konzervansi, pšenica, gluten.

## CHALLENGES OF THE MODERN CONSUMER

### ABSTRACT

In the research paper, I focus on how to buy healthy food. I believe that too little attention is given to hormonal disrupters and inflammation agents in food and that we consumers are blindly guided in purchases because we do not understand the whole matrix of food production and processing. The work arises from the assumption that these groups may be one of the main culprits for the mass flourishing of modern chronic diseases. There is a growing supply of food products on the shelves today. For that reason I wonder:

- how to identify healthy food;
- what is the role of the consumer in the tripartite relationship with the state and producers, and;
- how much knowledge does the consumer have about the researched area?

In search of answers, I focused on legislation; I interviewed Andreja Bizjak, an employee of the Slovenian Food Safety, Veterinary and Plant Protection Administration; and conducted a survey in which I researched the education and challenges of the modern consumer. I found out that the consumer, despite all the rules and laws governing the field of nutrition, is largely left to his own knowledge. Therefore, it is time to start educating ourselves and become responsible and conscious consumers.

**Keywords:** healthy food, consumer, pesticides, genetically modified organisms, preservatives, wheat, gluten.

# LABORATORIJSKE VAJE PRI POUKU KEMIJE NA DALJAVO

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## IZVLEČEK

Od današnjega izobraževalnega sistema se pričakuje uravnoteženo znanje na vseh področjih osebnega razvoja, ki bo uporabno v praksi. Zaradi zahtev po učinkovitem učenju in pridobivanju kakovostnega znanja, skoraj več ni mogoče pridobiti znanja s tradicionalnim poučevanjem in učenjem. Zato je nujno potrebna sprememba, miselni preskok, na področju izobraževalnega sistema. Epidemija in z njo učenje na daljavo sta pri naravoslovnih predmetih prinesla popolnoma nove izzive za doseganje ciljev, povezanih z eksperimentalnim delom. Eksperimentalno delo je pomemben del naravoslovnih predmetov. Izvajanje laboratorijskih vaj zahteva ustrezen prostor, primerno opremo in pomoč laboranta. Zato je izobraževanje na daljavo predstavljalo še poseben izziv pri laboratorijskih vajah. Medtem ko je predavanje učne snovi in ocenjevanje znanja dokaj enostavno izvajati preko spleta, pri eksperimentiranju ni tako. Učiteljem so na voljo ostale le redke vaje, ki jih je mogoče opraviti v domačem okolju in z vsakodnevnimi pripomočki ali uporabo raznih spletnih simulacij. Cilj raziskave je bil primerjati doseganje učnih ciljev dijakov pri laboratorijskih vajah na daljavo v primerjavi z laboratorijskimi vajami v šolskem laboratoriju.

**Ključne besede:** učenje, nova učna okolja, eksperimentalno delo, poučevanje na daljavo.

## ONLINE CHEMISTRY LABORATORY PRACTICE

### ABSTRACT

From today's educational system it is expected balanced knowledge in all fields of personal development that will be applicable in practice. Because of these needs, effective teaching and learning and the quality of knowledge is almost no longer possible to obtain with traditional teaching and learning methods. It is therefore urgently to aquire changes in the education system. The epidemic and the distance teaching, especially in science subjects, have brought completely new challenges to achieving the goals associated with the experimental work. Experimental work is an important part of science subjects. But performing laboratory exercises requires adequate place, appropriate equipment, and the assistance of a laboratory technician. Therefore, the distance teaching posed a particular challenge in the laboratory exercises. While lecturing and assessing knowledge is fairly easy to do online, experimentation is not. Teachers were left with only a few exercises that can be done in a home environment and with everyday accessories or the use of various online simulations. The research aimed to compare how students achieved their learning goals at laboratory exercises during distance learning in comparison to laboratory exercises in the school laboratory.

**Keywords:** learning, innovative classroom, experimental work, distance teaching.

# POMEN ZDRAVE PREHRANE IN GIBANJA NA RAZVOJ ŠPORTNO AKTIVNIH OTROK

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## **IZVLEČEK**

Prehranske potrebe otrok in mladostnikov so v primerjavi z odraslo osebo nekoliko drugačne. Mladi, še posebej pa tisti, ki se redno po več ur tedensko ukvarjajo s športom, imajo večje energijske potrebe kot njihovi vrstniki. Pomembno je, da se odraščajoče športnike spodbuja k redni zdravi prehrani, tako vsak dan zagotovijo telesu dovolj hranil, ki jih potrebuje za normalno delovanje. Ob pomoči aplikacije Prehranski navigator je načrtovanje in sestava jedilnika lažja. Hranila v osnovi delimo v pet skupin: ogljikove hidrate, beljakovine, maščobe, vitamine in minerale. Ogljikovi hidrati predstavljajo najpomembnejši vir energije. Njihova dnevna potreba je v največji meri odvisna od trajanja in intenzivnosti same aktivnosti ter telesne teže posameznika. Otroci in mladostniki imajo višje potrebe po beljakovinah kot odrasli, maščoba pa predstavlja največjo notranjo zalogo energije. Vitamini so bistveni za normalno delovanje telesa, za njihovo vezavo in tvorbo pa skrbijo minerali. Namen članka je predstaviti primer dobre prakse kako pri urah športa, z uvajanjem teorije o zdravi in uravnoteženi prehrani in pomoči aplikacije Prehranski navigator, učence naučiti pomembnosti spremljanja in po potrebi spreminjanja svojih prehrabnih navad.

**Ključne besede:** odraščanje, prehrana, Prehranski navigator, gibanje, šport, zdravje.

# **THE IMPORTANCE OF HEALTHY EATING AND EXERCISE ON THE DEVELOPMENT OF SPORTS ACTIVE CHILDREN**

## **ABSTRACT**

The nutritional needs of children and adolescents are slightly different compared to an adult. Young people, especially those who regularly do sports for several hours a week, have higher energy needs than their peers. It is important that growing athletes are encouraged to eat a regular healthy diet so that they provide the body with enough of the nutrients it needs to function normally every day. With the help of the Nutrition Navigator app, planning and composing a menu is easier. Nutrients are basically divided into three groups: carbohydrates, proteins, fats, vitamins and minerals. Carbohydrates are the most important source of energy. Their daily need largely depends on the duration and intensity of the activity itself and the body weight of the individual. Children and adolescents have higher protein needs than adults, and fat represents the largest internal store of energy. Vitamins are essential for the normal functioning of the body, and minerals are responsible for their binding and formation. The purpose of the article is to present an example of good practice at Physical Education, by introducing the theory of healthy and balanced diet and with a help of the Nutrition Navigator application teach students the importance of monitoring and if necessary, changing their eating habits.

**Keywords:** growing up, nutrition, Food navigator, exercise, sports, health.

# IMPLEMENTACIJA TUJEGA JEZIKA STROKE PREKO IZVEDBE VIRTUALNE MOBILNOSTI V OKVIRU MEDNARODNEGA PROJEKTA ERASMUS+

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## IZVLEČEK

Zaradi pandemije Covid-19 smo na SPSS ŠC Šentjur spomladi 2021 s partnersko šolo kmetijsko-gozdarsko Grottenhof iz Gradca v Avstriji izvedli 5-dnevno virtualno mobilnost Erasmus+ projekta Trajnostni razvoj v biotehnik. Pri aktivnostih je sodelovala tudi kmetijsko-gozdarska šola Hatzendorf. Virtualne mobilnosti se je je udeležilo 5 dijakov programa Kmetijsko-podjetniški tehnik, 3 dijaki programa Živilsko-prehranski tehnik in 7 dijakov programa Veterinarski tehnik. V projekt je bilo vključenih 9 tujih mentorjev in 6 učiteljev ŠC Šentjur. Izvedbo in učinkovitost virtualne mobilnosti preko zoom videokonferenc (s predstavitvijo vsebin s posnetki dobrih praks, neposrednega javljanja z delovišč) so dijaki ovrednotili z anketo. Glede na večinoma pozitivno vrednotenje vsebinske izvedbe virtualne mobilnosti, načina posredovanja strokovnih vsebin in tujega jezika stroke menimo, da je izvedba virtualne mobilnosti dokaj ustrezna alternativa fizični mobilnosti, vendarle pa je pridobivanje strokovno-teoretičnih in tujejezikovnih kompetenc na šoli gostiteljici, v avtentičnem okolju, optimalna oblika mobilnosti.

**Ključne besede:** virtualna mobilnost, fizična mobilnost, strokovno-teoretične kompetence, tuji jezik stroke

# **THE IMPLEMENTATION OF FOREIGN PROFESSIONAL LANGUAGE THROUGH THE IMPLEMENTATION OF VIRTUAL MOBILITY WITHIN THE INTERNATIONAL PROJECT ERASMUS+**

## **ABSTRACT**

Due to the Covid-19 pandemic, a 5-day virtual mobility of the Erasmus + project Sustainable Development in Biotechnology was carried out at the secondary school of the School Centre Šentjur in spring 2021 with the partner school the Grottenhof School of Agriculture and Forestry from Graz, Austria. The Hatzendorf School of Agriculture and Forestry also took part in the activities. Virtual mobility was attended by 5 students of the Agricultural-Entrepreneurial Technician programme, 3 students of the Food Processing Technician programme and 7 students of the Veterinary Technician programme. 9 foreign mentors and 6 teachers from the School Centre Šentjur were involved in the project. The implementation and effectiveness of virtual mobility through zoom video conferencing (with the presentation of content with recordings of good practices, direct reporting from work sites) was evaluated by students with a survey. Given the largely positive evaluation of the content of virtual mobility, the way of providing professional content and foreign professional language, we believe that the implementation of virtual mobility is a suitable alternative to physical mobility, but the acquisition of professional-theoretical and foreign language competencies at the host school, in an authentic environment, tends to be the optimal form of mobility.

**Keywords:** virtual mobility, physical mobility, professional-theoretical competencies, foreign professional language



# VZPOSTAVLJANJE TRAJNOSTNEGA RAZVOJA IN ODGOVORNEGA RAVNANJA S HRANO PRI POUKU TUJEGA JEZIKA

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## **IZVLEČEK**

Trajnostni razvoj ima eno izmed pomembnih vlog v izobraževanju. Pri samem pouku učitelji dostopajo do učenca večino dneva in ga učijo zraven splošnega znanja tudi ostale veščine, navade in poglede. Raziskava poteka na podlagi analize učenčevih stališč do trajnostnega razvoja pri pouku angleščine in poudarkom na ustreznem ravnanju s hrano ter kako lahko na primeru dobre rabe pouka pritegnemo učence do večje ozaveščenosti.

Na podlagi praktične izvedbe pouka o odgovornem ravnanju s hrano, odpadkih in recikliranju bodo predstavljeni rezultati dobre prakse in odziva učencev s pomočjo evalvacije učne ure. Možna bi bila analiza prakse pri ostalih šolskih predmetih, dnevih dejavnosti ter interesnih dejavnostih, s pomočjo inštrumentarija formativnega spremljanja.

Na podlagi analize izvedene učne ure je namen dela, da se usmeri in motivira tudi ostale strokovnjake, da se poslužujejo enakih oziroma podobnih načinov dela za doseganje trajnostnih učnih ciljev.

**Ključne besede:** angleščina, odnos, odgovorno ravnanje s hrano, trajnostni razvoj, tuji jezik.

# **MAINTAINING SUSTAINABLE DEVELOPMENT AND RESPONSIBLE FOOD HANDLING DURING LANGUAGE LESSONS**

## **ABSTRACT**

Sustainable development has an important role in education. During lessons, teachers have access to the students most of the day. In addition to general knowledge, teachers teach students other skills as well, such as habits and building an attitude. The research is conducted on the analysis of the learners' attitude towards sustainable development and responsible food handling in English lessons, as well as to develop successful lessons to attract students to greater awareness.

Based on lesson analysis about responsible food handling, waste and recycling, as well as the students' evaluation, results of good practice will be presented. A further analysis of lessons within other school subjects, curricular activities and extracurricular activities would be possible with the help of formative assessment tools.

The intention itself is based on the analysis of a completed lesson, to direct and motivate other professionals to take same or similar ways to achieve lasting learning goals.

**Keywords:** attitude, English, foreign language, responsible food handling, sustainable development.

# PRIMERJAVA UČINKOVITOSTI SAMOOSKRBNIH HIŠ

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## IZVLEČEK

V današnjem času dajemo vedno večji pomen samooskrbnim hišam. Seveda želimo za investicije plačati čim manj denarja, ampak ob konstantnih podražitvah energentov moramo gledati tudi na porabo, ne smemo pa pozabiti na ohranjanje našega planeta in dolgoročni vpliv na podnebje.

V članku sem delal primerjavo med dvema hišama približno enakih ogrevalnih površin, zidani z enakim zidakom in enako toplotno izolacijo. Ena hiša je ogrevana s toplotno črpalko, tudi sanitarna voda, medtem ko je druga ogrevana z električno pečjo v povezavi s sončno elektrarno, za sanitarno vodo pa uporablja električni bojler.

Cilji primerjave so bili ugotoviti:

- razlika v ceni investicije,
- razlika v porabi energije,
- kateri način ogrevanja se bolj splača glede na dolgo dobo.

Analiza je pokazala, da se dolgoročno bolj splača nakup električne peči in boilerja, ter izgradnja sončne elektrarne.

**Ključne besede:** toplotna črpalka, električna peč, električni bojler, sončna elektrarna.

## **THE EFFICIENCY COMPARISON OF TWO SELF-CATERING HOUSES**

### **ABSTRACT**

In this day and age the value and meaning of self-catering houses is steeply growing. Of course we want to minimize the investment costs, but with the constant increase in prices of energy sources we must think about our energy consumption while keeping in mind the maintenance of our planet, environmental consequences and long term effects on climate conditions.

I compared two houses with approximately same amount of heating surfaces, build with the same brick and same heat isolation. One of the houses was heated by a heat pump, including the sanitary water, while the other used an electrical furnace in combination with a solar power plant and an electrical boiler for the sanitary water.

The goals of the comparison were to establish:

- the difference in investment costs,
- the difference in energy consumption,
- which heating option presents the most cost effective possibility in the long run.

The analysis has shown that the combination of electrical furnace, electrical boiler and solar power plant is the most cost effective option in the long run.

**Keywords:** heat pump, electrical furnace, electrical boiler, solar power plant.

# ZDRAVA PREHRANA DIJAKOV DVOJEZIČNE SREDNJE ŠOLE LENDAVALA

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## IZVLEČEK

Epidemija je spremenila življenje vseh nas, to je vplivalo tudi na telesno aktivnost in prehranske navade prebivalstva. Dijaki so bili verjetno še bolj izpostavljeni, saj je njihovo izobraževanje potekalo na daljavo, tako so še več časa preživeli sede, pred računalnikom. To je povzročilo upad gibalne aktivnosti, istočasno pa je prišlo do porasta pri prekomerni in nepravilni prehrani dijakov. V raziskavi smo preverili, ali se to odraža tudi v njihovih prehranskih navadah, saj se v šoli učijo o zdravem načinu prehranjevanja, kljub temu pa tega ne upoštevajo vedno. V anonimni anketi smo želeli preveriti, kakšne prehranske navade imajo dijaki in če sledijo zdravemu načinu življenja. V anketi je sodelovalo 112 dijakov DSŠ Lendava. Naši cilji so bili ugotoviti, ali dijaki vedo, da s prehrano lahko vplivamo na svoje zdravje in ugotoviti, kakšne prehranske navade imajo. Analiza ankete je pokazala, da se dijaki zavedajo pomembnosti zdrave prehrane, ki vpliva na kakovost življenja, kljub temu zavedanju pa nekateri dijaki posežejo po nezdravi prehrani ali pijači. Prispevek pomaga razumeti prehranske navade in razmišljanje dijakov o zdravi prehrani.

**Ključne besede:** uravnotežena prehrana, zajtrk, malica, kosilo, pijača, dijaki.

## HEALTHY DIET OF DVOJEZIČNA SREDNJA ŠOLA LENDAVA STUDENTS

### ABSTRACT

The pandemic changed everyone's lives while also affecting the physical activity and eating habits of the population. Students were possibly affected even more since their education was happening online, hence they spent more time in a sitting position in front of their computers. This caused a decline in physical activity and at the same time, it led to an increase in excessive and incorrect diets for students. The study tries to determine if this can be seen in their eating habits because, in school, they are learning how to maintain healthy eating habits. Nevertheless, they do not follow those all the time. By conducting an anonymous survey, we intended to determine the eating habits of the students and to check if they are following guidelines for a healthy lifestyle. 112 DSŠ Lendava students took part in the survey. Our goals were to find out if students know that a certain diet can affect our health and what eating habits they have. The analysis of the survey showed that students are aware of the importance of a healthy diet which affects the quality of life. Despite being aware of that some students still enjoy unhealthy food and drinks. This paper helps to understand the eating habits and the students' thinking about a healthy diet.

**Keywords:** balanced diet, breakfast, lunch, drinks, students.

# SAMOOSKRBA GOSPODINJSTVA Z ELEKTRIČNO ENERGIJO

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## IZVLEČEK

V strokovnem prispevku smo raziskali možnosti samooskrbe gospodinjstev z električno energijo. Nato smo s pomočjo podatkov na spletu izračunali, v kolikšnem času se povrnejo denarna sredstva pri investiciji v samooskrbo z električno energijo. Ugotovili smo, da je bolj ekonomično imeti samooskrbo brez shranjevalnih baterij, saj so cene le-teh zelo visoke. K stroki prispevamo tako, da smo s pomočjo izračunov dokazali, da se postavitev sončne elektrarne najbolj izplača, če imamo letno porabo večjo od 3000 kWh. Pri takšni letni porabi se stroški povrnejo v petnajstih letih. V primeru, da imamo letno porabo 9000 kWh, pa se stroški povrnejo v dvanajstih letih. V primeru podražitve električne energije pa se stroški povrnejo veliko prej in tudi prihranki bodo veliko večji. V strokovnem prispevku smo pri proizvodnji modulov ugotovili, da če znaša izkoristek naprav za pripravo modulov 90 %, bi pri izdelavi enega modula proizvedli 490,6 kg emisij CO<sub>2</sub>. Izračunali smo, da bi v 6,58 leta z modulom proizvedli toliko energije, kot smo jo porabili za proizvodnjo samega modula. Če bi imela naprava za izdelavo solarnih modulov 50-% izkoristek, bi potrebovali 7,86 leta.

**Ključne besede:** samooskrba, sončna elektrarna, sončni moduli, sončne celice, električna energija, onesnaževanje okolja.

## HOUSEHOLD SELF-SUFFICIENCY WITH ELECTRICITY

### ABSTRACT

In this paper, we researched different options of household self-sufficiency with electricity. By using data on the internet, we calculated how long it would take for the money invested in a self-sufficiency household with electricity to be returned. We found that it is more economical to have self-sufficiency without storage batteries since their price is relatively high, whereas their life expectancy is quite short. We contribute to our profession since we proved with our calculations that setting up a solar power plant pays off the most if our yearly consumption is more than 3000kWh. With such a yearly consumption the investment is to be returned in 15 years. If our yearly consumption is 9000 kWh, the investment is to be returned in 12 years. In this paper, we found that in the manufacture of modules we would produce 490,6 kg of CO<sub>2</sub> emissions if the efficiency of the module preparation devices is 90%. We calculated that with a module we would produce in 6,58 years the same amount of energy as was used for producing the module itself. If the device for the production of solar modules had a 50% efficiency, we would need 7,86 years to produce the same amount of energy we used for the production.

**Keywords:** self-sufficiency, solar power plant, solar modules, solar panels, electricity, environmental pollution.



# OPRAŠEVANJE ČEBEL IN NJIHOV POMEN V POMURJU

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## **IZVLEČEK**

Prispevek temelji na praktičnih izkušnjah in analizah opravevanja v pomurski regiji in širše. Čebele in njihovo opravevanje imajo velik vpliv predvsem na količino pridelka na sadnem drevju in drugih sadežih. Ob slabih letinah in težavah z vremenom se to še veliko bolj pozna. Ugotovili smo, da čebele za delo in življenje potrebujejo mir, čisto pitno vodo, sonce in zavetje pred močnimi vetrovi. Čebele, ki so prezimovale na mirni lokaciji ob spomladanskih cvetovih, čisti vodi in zavetju, so bile tudi do 30 % močnejše in hitrejše v razvoju kot tiste, ki so bile skozi zimo izpostavljene vetru in brez velike možnosti dosega spomladanskega cvetja. Brez čebel ni človeštva.

**Ključne besede:** opravevanje, čebela, pitna voda, človeštvo

## **THE POLLINATION OF BEES AND THEIR IMPORTANCE IN THE POMURJE REGION**

### **ABSTRACT**

This paper is based on the practical experience and analyses of pollination in the Pomurje region and more broadly. Bees and their pollination have a great impact especially on the quantity of harvest on fruit trees and other fruit. During a poor harvest and issues with the weather, this is, even more, the case. We found for work and life in general bees need peace, clean drinking water, sun and shelter from strong winds. Bees that overwintered on a peaceful location beside spring blossoms, clean water and shelter were also up to 30% stronger and quicker in development as those who were throughout winter exposed to winds and fewer possibilities of reaching spring blossoms. There is no humanity without bees.

**Keywords:** pollination, bee, drinking water, humanity.

