

## Прилог бр. 1.

### НАСТАВНО-НАУЧНОМ ВИЈЕЋУ ТЕХНОЛОШКОГ ФАКУЛТЕТА ЗВОРНИК СЕНАТУ УНИВЕРЗИТЕТА У ИСТОЧНОМ САРАЈЕВУ

**Предмет:** Извјештај комисије о пријављеним кандидатима за избор у академско звање редовни професор, ужа научна област „Храна и пиће“.

Одлуком Наставно-научног вијећа Технолошког факултета у Зворнику, Универзитета у Источном Сарајеву, број ННВ: 1648/2020 од 09.10.2020., именовани смо у Комисију за разматрање конкурсног материјала и писање извјештаја по конкурс, објављеном у дневном листу “Глас Српске“ од 29.09.2020. године, за избор у академско звање **редовни професор**, ужа научна област „Храна и пиће“.

#### ПОДАЦИ О КОМИСИЈИ

Састав комисије <sup>1</sup> са назнаком имена и презимена сваког члана, звања, назив научне области, научног поља и уже научне/умјетничке области за коју је изабран у звање, датума избора у звање и назив факултета, установе у којој је члан комисије запослен:
1. Др Александар Фиштеш, ред. проф., предсједник, Научна област: Технолошко инжењерство (Инжењерство и технологија) Научно поље: Прехрамбено инжењерство (Остала инжењерства и технологије) Ужа научна/умјетничка област: Технологија угљенохидратне хране (Храна и пиће) Датум избора у звање: 25.02.2020. Универзитет: Универзитет у Новом Саду Факултет: Технолошки факултет, Нови Сад
2. Др Биљана Пајин, ред. проф., члан Научна област: Технолошко инжењерство (Инжењерство и технологија) Научно поље: Прехрамбено инжењерство (Остала инжењерства и технологије) Ужа научна/умјетничка област: Технологија угљенохидратне хране (Храна и пиће) Датум избора у звање: 02.06.2015. Универзитет: Универзитет у Новом Саду Факултет: Технолошки факултет, Нови Сад
3. Др Јованка Попов Раљић, ред. проф у пензији., члан Научна област: Технолошко инжењерство (Инжењерство и технологија) Научно поље: Прехрамбено инжењерство (Остала инжењерства и технологије) Ужа научна/умјетничка област: Технологија и квалитет хране (Храна и пиће) Датум избора у звање: 21.09.2018. Универзитет: Универзитет Сингидунум, Београд Ужа научна/умјетничка област: Гастрономија (Храна и пиће) Факултет: Природно-математички факултет Датум избора у звање: 14.05.2010. Универзитет: Универзитет у Новом Саду Факултет: Природно-математички факултет Универзитет: Универзитет у Новом Саду Факултет: Природно-математички факултет

<sup>1</sup> Комисија се састоји од најмање три наставника из научног поља, од којих је најмање један из уже научне/умјетничке за коју се бира кандидат. Најмање један члан комисије не може бити у радном односу на Универзитету у Источном Сарајеву, односно мора бити у радном односу на другој високошколској установи. Чланови комисије морају бити у истом или вишем звању од звања у које се кандидат бира и не могу бити у сродству са кандидатом.

На претходно наведени конкурс пријавио се 1 кандидат:

**Александра (Мирослав) Торбица**

На основу прегледа конкурсне документације, а поштујући прописане чланове<sup>2</sup> 77., 78. и 87. Закона о високом образовању („Службени гласник Републике Српске“ бр. 73/10, 104/11, 84/12, 108/13, 44/15, 90/16), чланове 148. и 149. Статута Универзитета у Источном Сарајеву и чланове 5., 6., 37., 38. и 39<sup>3</sup>. Правилника о поступку и условима избора академског особља Универзитета у Источном Сарајеву, Комисија за писање извјештаја о пријављеним кандидатаима за изборе у звања, Наставно-научном вијећу Технолошког факултета Зворник и Сенату Универзитета у Источном Сарајеву подноси слиједећи извјештај на даље одлучивање:

## ИЗВЈЕШТАЈ

### КОМИСИЈЕ О ПРИЈАВЉЕНИМ КАНДИДАТИМА ЗА ИЗБОР У ЗВАЊЕ

<b>I ПОДАЦИ О КОНКУРСУ</b>
<b>Одлука о расписивању конкурса, орган и датум доношења одлуке</b>
<b>01-С-249-IV/20, Универзитет у Источном Сарајеву, од 24.09.2020. и</b>
<b>Дневни лист, датум објаве конкурса</b>
<b>„Глас Српске“ од 29.09.2020. године</b>
<b>Број кандидата који се бира</b>
<b>1 (један)</b>
<b>Звање и назив уже научне/умјетничке области, уже образовне области за коју је конкурс расписан, списак предмета</b>
<b>Редовни професор, Храна и пиће</b>
<b>Број пријављених кандидата</b>
<b>1 (један)</b>

<b>II ПОДАЦИ О КАНДИДАТИМА</b>
<b>ПРВИ КАНДИДАТ</b>
<b>1. ОСНОВНИ БИОГРАФСКИ ПОДАЦИ</b>
<b>Име (име једног родитеља) и презиме</b>
<b>Александра (Мирослав) Торбица</b>
<b>Датум и мјесто рођења</b>
<b>04.02.1968., Нови Сад</b>
<b>Установе у којима је кандидат био запослен</b>
<ol style="list-style-type: none"> <li>1. Прехрамбено-угоститељско-трговачко предузеће ”Дунав“, Нови Сад</li> <li>2. ”Маткомерц“ д.о.о., Нови Сад</li> <li>3. Холдинг компанија ”Š-Panoniја-komerc“ д.о.о, Нови Сад</li> </ol>

<sup>2</sup> У зависности од звања у које се кандидат бира, наводи се члан 77. или 78. или 87.

<sup>3</sup> У зависности од звања у које се кандидат бира, наводи се члан 37. или 38. или 39.

4. Vekić Chocolate“ д.о.о, Нови Сад
5. Технолошки факултет, Универзитет у Новом Саду, Завод за технологију жита и брашна
6. Научни институт за прехранбене технологије у Новом Саду, Универзитета у Новом Саду
<b>Звања/радна мјеста</b>
1. 01.12.1993-01.12.1994. године - Прехрамбено-угоститељско-трговачко предузеће ”Дунав“, Нови Сад - приправнички стаж преко Тржишта рада.
2. 01.12.1994-16.04.1995. године, Прехрамбено-угоститељско-трговачко предузеће ”Дунав“, Нови Сад - технолог погона за производњу хлеба, пецива и колача.
3. 17.04.1995-28.02.1996. године, ”Маткомерц“ д.о.о., Нови Сад – комерцијалиста.
4. 01.03.1996-30.06.1997. године, холдинг компанија ”Š-Panoniја-komerc“ д.о.о, Нови Сад - руководилац производње и главни технолог у погону за производњу кечапа, мајонеза, салатних прелива, воћних сирупа и сокова (покренула производњу кечапа, мајонеза, салатних прелива, као и воћних сирупа и сокова.
5. 01.07.1997-24.05.2001. године, ”Vekić Chocolate“ д.о.о, Нови Сад - директор фабрике и главни технолог у погону за производњу кондиторских мазивих-какао, млечних и лешник крем производа.
7. 17.06.2002-31.12.2006. године ради у Заводу за технологију жита и брашна, Технолошки факултет, Универзитет у Новом Саду који се 01.01.2007. трансформисао у Научни институт за прехранбене технологије у Новом Саду, Универзитета у Новом Саду.
6. 01.01.2007. до данас: Научни институт за прехранбене технологије у Новом Саду, Универзитета у Новом Саду
Научна област
Инжењерство и технологија
Чланство у научним и стручним организацијама или удружењима
Удружење прехранбених технолога Србије
<b>2. СТРУЧНА БИОГРАФИЈА, ДИПЛОМЕ И ЗВАЊА</b>
<b>Основне студије/студије првог циклуса</b>
Назив институције, година уписа и завршетка
Технолошки факултет Нови Сад, Универзитет у Новом Саду
Назив студијског програма, излазног модула
Прехрамбено инжењерство, Смер угљенохидратне хране
Просјечна оцјена током студија <sup>4</sup> , стечени академски назив
Дипломирани инжењер прехранбене технологије
<b>Постдипломске студије/студије другог циклуса</b>
Назив институције, година уписа и завршетка
Технолошки факултет Нови Сад, Универзитет у Новом Саду
Назив студијског програма, излазног модула
Прехрамбено инжењерство, Смер угљенохидратне хране и Технологије масти и уља
Просјечна оцјена током студија, стечени академски назив

<sup>4</sup> Просјечна оцјена током основних студија и студија првог и другог циклуса наводи се за кандидате који се бирају у звање асистента и вишег асистента.

1993/1994 до 2002/2003
Наслов магистарског/мастер рада
Утицај еквивалената маслаца на физичке особине и трајност чоколаде
Ужа научна/умјетничка област
Прехрамбено инжењерство
<b>Докторат/студије трећег циклуса</b>
Назив институције, година уписа и завршетка (датум пријаве и одбране дисертације)
Технолошки факултет Нови Сад, Универзитет у Новом Саду
Наслов докторске дисертације
Карактеристике глутенско-глијадинског комплекса зрна као показатељ технолошког квалитета пшенице
Ужа научна област
Примењене и инжењерске хемије
<b>Претходни избори у звања (институција, звање и период)</b>
2002-2004: Сарадник на пословима трансфера науке у праксу - Технолошки факултет, Нови Сад
2004-2008: Истраживач сарадник - Технолошки факултет, Универзитет у Новом Саду
2008-2013: Научни сарадник – Научни институт за прехрамбене технологије у Новом Саду, Универзитет у Новом Саду
2009-2015: Доцент – Технолошки факултет, Зворник, Универзитет у Источном Сарајеву
2011: Доцент – Фармацеутски факултет, Нови Сад, Европски универзитет у Београду
2013-до данас: Научни саветник – Институт за кукуруз „Земун Поље“, Београд-Земун
2015-до данас: Технолошки факултет, Зворник, Универзитет у Источном Сарајеву
2017: Почасни професор - School of Food Engineering, Harbin University of Commerce, Кина
<b>3. НАУЧНА/УМЈЕТНИЧКА ДЈЕЛАТНОСТ КАНДИДАТА</b>
<b>Радови прије посљедњег избора</b>
<b><u>Поглавље у књизи М11 (истакнутој монографији међународног значаја) (М13)</u></b>
1. <b>Torbica, A., Hadnađev, M., Dapčević Hadnađev, T., Dokić, P.: Chapter title: Functional Gluten Alternatives, 49-74, Book title: Gluten: Properties, Modifications and Dietary Intolerance, Editor: Diane S. Fellstone, Nova Science Publishers Inc, Hauppauge NY 11788-3619, United States of America, 2011 (ISBN 978-1-61209-317-8).</b>
ebook: <a href="https://www.novapublishers.com/catalog/product_info.php?products_id=16403">https://www.novapublishers.com/catalog/product_info.php?products_id=16403</a>
<b><u>Поглавље у књизи М12 (монографији међународног значаја) (М14)</u></b>
1. <b>Dapčević Hadnađev, T., Pojić, M., Hadnađev, M., Torbica, A.: Chapter title: The Role of Empirical Rheology in Flour Quality Control, 335-360, Book title: Wide Spectra of Quality Control, Isin Akyar (Ed.), InTech - Open Access Publisher, 2011 (ISBN 978-953-307-683-6).</b>
doi: 10.5772/24148
ebook: <a href="http://www.intechopen.com/books/wide-spectra-of-quality-control/the-role-">http://www.intechopen.com/books/wide-spectra-of-quality-control/the-role-</a>

of-empirical-rheology-in-flour-quality-control

**РАДОВИ ОБЈАВЉЕНИ У НАУЧНИМ ЧАСОПИСИМА МЕЂУНАРОДНОГ ЗНАЧАЈА (M20)****Рад објављен водећем међународном часопису (M21)**

1. **Torbica, A.**, Hadnađev, M., Dapčević, T.: Rheological, textural and sensory properties of gluten-free bread formulations based on rice and buckwheat flour, *Food Hydrocolloids* 24, 6-7, August-October, 626-632, 2010. doi:10.1016/j.foodhyd.2010.03.004.
2. **Torbica, A.**, Živančev, D., Nikolić, Z., Đorđević, V., Nikolovski, B.: The advantages of Lab-on-a-Chip method in determination of Kunitz trypsin inhibitor in soybean varieties, *Journal of Agricultural and Food Chemistry*, 58, 13, 7980-7985, 2010. doi: 10.1021/jf100830m
3. **Torbica, A.**, Pajin, B, Omorjan, R.: Influence of soft Cocoa Butter Equivalent on colour and other physical attributes of chocolate. *Journal of the American Oil Chemists' Society*, 88, 7, 937–947, 2011. doi: 10.1007/s11746-011-1763-6.
4. Sakač, M., **Torbica, A.**, Sedej, I., Hadnađev, M.: Influence of breadmaking on antioxidant capacity of gluten free breads based on rice and buckwheat flours. *Food Research International*, 44, 9, 2806-2813, 2011. doi: 10.1016/j.foodres.2011.06.026.
5. Šarić, Lj., Šarić, B., Mandić, A., **Torbica, A.**, Tomić, J., Cvetković, D., Okanović, Đ.: Antibacterial properties of Domestic Balkan donkey's milk originated from Serbia. *International Dairy Journal*, 25, 2, 142-146, 2012. doi: 10.1016/j.idairyj.2012.03.007.
6. Dapčević Hadnađev, T., **Torbica, A.**, Hadnađev, M.: Influence of Buckwheat Flour and Carboxymethyl Cellulose on Rheological Behaviour and Baking Performance of Gluten-Free Cookie Dough. *Food and Bioprocess Technology*, 2013, 6(7), 1770-1781. doi 10.1007/s11947-012-0841-6.
7. **Torbica, A.**, Hadnađev, M., Dapčević Hadnađev, T.: Rice and buckwheat flour characterisation and its relation to cookie quality. *Food Research International*, 48, 1, 277–283, 2012. doi: 10.1016/j.foodres.2012.05.001.
8. Nikolić, Z., Đorđević, V., **Torbica, A.**, Mikić, A.: Legumes seed storage proteins characterization by SDS-PAGE and Lab-on-a-Chip electrophoresis. *Journal of Food Composition and Analysis*, 28, 2, 75-80, 2012. doi: 10.1016/j.jfca.2012.08.005.
9. Dapčević Hadnađev, T., Pajić-Lijaković, I., Hadnađev, M., Mastilović, J., **Torbica, A.**, Bugarski, B. (2013). Influence of starch sodium octenyl succinate on rheological behaviour of wheat flour dough systems. *Food Hydrocolloids*, 33 (2), 376-383.
10. Dapčević Hadnađev, T.R., Dokić, L.P., Hadnađev, M.S., Pojić, M.M., **Torbica, A.M.**: Rheological and Breadmaking Properties of Wheat Flours Supplemented with Octenyl Succinic Anhydride-Modified Waxy Maize Starches. *Food and Bioprocess Technology*, 7, 1, 235-247, 2014. doi 10.1007/s11947-013-1083-y.
11. Kevrešan, Ž.S., Mastilović, J.S., Mandić, A.I., **Torbica, A.M.** Effect of Different Ripening Conditions on Pigments of Pepper for Paprika Production at Green Stage of Maturity. *Journal of Agricultural and Food Chemistry*, 2013, 61(8), 9125-9130.
12. Tomić, J., Pojić, M., **Torbica, A.**, Rakita, S., Živančev, D., Janić Hajnal, E., Dapčević Hadnađev, T., Hadnađev, M. Changes in the content of free sulphhydryl groups during postharvest wheat and flour maturation and their influence on

- technological quality. *Journal of Cereal Science*, 2013, 58(3), 495-501. DOI: 10.1016/j.jcs.2013.09.012
13. Rakita, S.D.S., Pojić, M., Tomić, J., **Torbica, A.** Determination of free sulphydryl groups in wheat gluten under the influence of different time and temperature of incubation: Method validation. *Food Chemistry*, 2014, 150, 166-173. DOI: 10.1016/j.foodchem.2013.10.128
14. **Torbica A.**, Mastilović, J., Pojić, M., Kevrešan, Ž. Effects of Wheat Bug (*Eurygaster* spp. and *Aelia* spp.) Infestation in Preharvest Period on Wheat Technological Quality and Gluten Composition. *The Scientific World Journal*, 2014, 2014, Article number 148025. <http://dx.doi.org/10.1155/2014/148025>
15. Hadnađev, M., Dapčević Hadnađev, T., Dokić, Lj., Pajin, B., **Torbica, A.**, Šarić, Lj., Ikonić, P. Physical and sensory aspects of maltodextrin gel addition used as fat replacers in confectionery filling systems. *LWT - Food Science and Technology*, 2014, 59, 495-503. DOI: 10.1016/j.lwt.2014.04.044
16. Janić Hajnal, E., Tomić, J., **Torbica, A.**, Rakita, S., Pojić, M., Živančev, D., Hadnađev, M., Dapčević Hadnađev, T. Content of free amino groups during postharvest wheat and flour maturation in relation to gluten quality. *Food Chemistry*, Volume 164, December 2014, Pages 158–165. DOI: 10.1016/j.foodchem.2014.05.054

#### **Рад објављен у истакнутом међународном часопису (M22)**

1. Popović, L., Peričin, D., Vaštag, Z., Popović, S., Krimer, V., **Torbica, A.**: Antioxidative and Functional Properties of Pumpkin Oil Cake Globulin Hydrolysates. *Journal of the American Oil Chemists' Society*, 2013, 90(8), 1157-1165. doi: 10.1007/s11746-013-2257-5.
2. **Torbica A.**, Pajin, B., Omorjan, R., Lončarević, I., Tomić, J. Physical properties of chocolate with addition of Cocoa Butter Equivalent of moderate hardness. *Journal of the American Oil Chemists' Society*, 2014, 91(8), 39-48. doi: DOI 10.1007/s11746-013-2357-2.
3. Lončarević, I., Pajin, B., Omorjan, R., **Torbica, A.**, Zarić, D., Maksimović, J., Švarc Gajić, J. The influence of lecithin from different sources on crystallization and physical properties of nontrans fat. *Journal of Texture Studies*, 2013, 44(6), 450-458. DOI: 10.1111/jtxs.12033
4. Mastilović, J., Kevrešan, Ž., **Torbica, A.**, Janić Hajnal, E., Živančev, D. Prediction of traditionally utilized wheat dough technological quality parameters from Mixolab values: development and evaluation of regression models. *International Journal of Food Science & Technology*, 2014, 49(12), 2685-2691. AID IJFS12601
5. Hadnađev, M., Dapčević Hadnađev, T., Pojić, M., **Torbica, A.**, Tomić, J., Rakita, S., Janić Hajnal, E. Changes in the rheological properties of wheat dough during wheat short-term storage. *Journal of the Science of Food and Agriculture*, 2014, DOI: 10.1002/jsfa.6782 *in press*
6. Vukić, V., Hrnjez, D., Kanurić, K., Milanović, S., Iličić, M., **Torbica, A.**, Tomić, J. The Effect of Kombucha Starter Culture on the Gelation Process, Microstructure and Rheological Properties During Milk Fermentation. *Journal of Texture Studies*, 2014, 45(4), 261-273. DOI: 10.1111/jtxs.12071.
7. Tomić, J., **Torbica, A.**, Popović, Lj., Strelec, I., Vaštag, Ž., Pojić, M., Rakita, S.

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**ЗБОРНИЦИ МЕЂУНАРОДНИХ НАУЧНИХ СКУПОВА (М30)****Саопштење са међународног скупа штампано у целини (М33)**

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### **НАЦИОНАЛНЕ МОНОГРАФИЈЕ, ТЕМАТСКИ ЗБОРНИЦИ ЛЕКСИКОГРАФСКЕ....(M40)**

#### **Поглавље у монографији националног значаја M42 (M45)**

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#### **ОБЈАВЉЕНИ РАДОВИ НАЦИОНАЛНОГ ЗНАЧАЈА (M50)**

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##### **Рад у часопису националног значаја (M52)**

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#### **ЗБОРНИЦИ СКУПОВА НАЦИОНАЛНОГ ЗНАЧАЈА (M60)**

#### **Рад саопштен на скупу националног значаја штампан у целини (M63)**

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12. Živančev, D., Mastilović, J., **Torbica, A.**, Kevrešan, Ž., Tomić J., Rakita S. (2013): Optimisation of test baking procedure and development of objective baking properties evaluation system. Book of Abstracts of 7th International Congress Flour-Bread '13, 9<sup>th</sup> Croatian Congress of Cereal Technologists, Opatija, Croatia, October 16-18, 2013, 9. ISSN: 1848-2554, Izdavač: Josip Juraj Strossmayer University of Osijek, Faculty of Food Technology Osijek
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14. Mastilović, J., **Torbica, A.** Dileme i propisi u tehničkim propisima koji regulišu kvalitet pekarskih i poslastičarskih proizvoda. Zbornik sažetaka, 18. Pekarski dan, 25. april 2013, Beograd, 14, 2013 (ISSN 1452-8940).
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16. Mastilović, J., Kevrešan, Ž., **Torbica, A.**, Vukić, M., Ivanović, M. Influence of variety and location on mineral composition of wheat and flour and the distribution on minerals in wheat milling fractions. Book of Abstracts of 7th International Congress Flour-Bread '13, 2013, 9<sup>th</sup> Croatian Congress of Cereal Technologists, Opatija, Croatia, October 16-18, 2013, 5. ISSN: 1848-2554, Izdavač: Josip Juraj Strossmayer University of Osijek, Faculty of Food Technology Osijek

### **ТЕХНИЧКА РЕШЕЊА (M80)**

#### **Нови производна линија, нови материјал, индустријски прототип, ново прихваћено решење проблема у области макроекономског, социјалног и проблема одрживог производног развоја уведени у производњу (M82)**

1. **Торбица, А.**, Хаднађевић, М.: Безглутенски тврди кекс на бази пиринча и хељде, са повећаним садржајем природних антиоксидативних материја, намењен индустријској производњи, Нови производ је прихваћен и производи се у АД Пекара "Кикинда", Кикинда, 2010.

### **РЕАЛИЗОВАНИ ПАТЕНТИ (M92)**

1. **Торбица, А.**, Хаднађевић, М., Сакач, М., Кеврешан, Ж., Матић, Ј.: Безглутенски хлеб на бази пиринча и хељде, без додатка адитива, и са повећаним садржајем природних антиоксидативних материја, регистар патената ЗИС – Решење бр. 53309 (решење о преносу овлашћења број 4/452 од 17. 4. 2014.).

### **ПРИЈАВЉЕНИ ПАТЕНТИ (M90)**

2. **Торбица, А.**, Хаднађевић, М., Сакач, М., Седеј, И., Мандић, А., Песторић, М., Мишан, А.: Безглутенски тврди кекс на бази пиринча и хељде, са повећаним садржајем природних антиоксидативних материја, намењен индустријској производњи, П-2010/0132, Завод за интелектуалну својину, 23.03.2010.

**Радови послуже последице избора<sup>5</sup>** (J – часопис; C – конгрес, конференција, зборник,...)

### **I Објављени радови у часопису међународног значаја (импакт фактор) R51:**

- J-1.** Hadnađev, M., Dapčević Hadnađev, T., Pojić, M., **Torbica, A.**, Tomić, J., Rakita, S., Janić Najnal, E. (2015). Changes in the rheological properties of wheat dough during wheat short-term storage. Journal of the Science of Food and

<sup>5</sup> Навести кратак приказ радова и књига (научних књига, монографија или универзитетских уџбеника) релевантних за избор кандидата у академско звање.

Agriculture, 95(3), 569-575.

**Кратак приказ рада:**

*The aim of the present study was to investigate the ability of the small- and large-deformation fundamental rheological tests to monitor the changes during short-term post-harvest storage of wheat. At the end of wheat storage period, wet gluten quantity decreased, while gluten index increased in comparison to those of freshly harvested samples. The rheological properties of dough changed over the pre-defined period of storage in terms of becoming more elastic and less extensible in comparison to that of freshly harvested wheat. Visco-elastic properties of weaker flour samples changed more markedly during storage than those of stronger flours, indicating that the intensity of dough rheological changes during wheat storage might be dependent on gluten quality and were the characteristic of wheat variety. It was shown that small deformation dynamic oscillation and large deformation creep-recovery tests can be successfully employed to monitor the changes in flour quality during wheat storage and that required storage period after wheat harvesting has to be defined according to wheat variety initial rheological properties and its gluten quality.*

- J-2.** Janić Hajnal, E., Orčić, D., **Torbica, A.**, Kos, J., Mastilović, J., Škrinjar, M. (2015). Alternaria toxins in wheat from Autonomous Province of Vojvodina, Serbia: A preliminary survey. Food Additives & Contaminants: Part A, 32(3), 361-370.

**Кратак приказ рада:**

*Although Fusarium species remain a main source of mycotoxin contamination of wheat, in recent years, due to the evident climatic changes, other mycotoxigenic fungi have been recognised as important wheat contaminants. Alternaria species, especially A. alternata, have been found as contaminants of wheat as well as wheat-based products. Under favourable conditions A. alternata very often produce alternariol (AOH), alternariol monomethyl ether (AME), tenuazonic acid (TeA) and others Alternaria toxins. The aim of the present study was to examine the presence of three Alternaria toxins (AOH, AME and TeA) in wheat samples harvested during three years (2011–13). To this end, 92 samples were collected during wheat harvesting from different growing regions of the Autonomous Province of Vojvodina, which represents the most important wheat-growing area in Serbia. The presence of Alternaria toxins was analysed by HPLC with electrospray ionisation triple quadrupole mass spectrometry (LC-ESI-MS/MS). Among all the analysed wheat samples, 63 (68.5%) were contaminated with TeA, 11 (12.0%) with AOH and 6 (6.5%) with AME. Furthermore, the maximum and mean toxin concentrations were 2676 and 92.4  $\mu\text{g kg}^{-1}$ , 48.9 and 18.6  $\mu\text{g kg}^{-1}$ , and 70.2 and 39.0  $\mu\text{g kg}^{-1}$  for TeA, AOH and AME, respectively. Co-occurrence of three Alternaria toxins in wheat samples was detected in six samples; a combination of two toxins was found in two samples; and 64 samples contained one toxin. The results showed that among 92 analysed wheat samples, only 20 (21.7%) samples were without Alternaria toxins. The presence of Alternaria toxins was also investigated in terms of weather conditions recorded during the period of investigation, as well as with the sampling region. This study represents the first preliminary report of the natural occurrence of Alternaria toxins in wheat (Triticum aestivum) from Serbia.*

- J-3.** Sakač, M., Pestorić, M., Mišan, A., Nedeljković, N., Jambrec, D., Jovanov, P., Banjac, V., **Torbica, A.**, Hadnadev, M., Mandić, A. (2015). Antioxidant capacity, mineral content and sensory properties of rice-buckwheat gluten-free cookies. Food Technology and Biotechnology, 53 (1):38-47.

**Кратак приказ рада:**

*Light buckwheat flour was used to substitute rice flour at the level of 10, 20 and 30 % to produce gluten-free cookies. The substitution of gluten-free cookie formulation with light buckwheat flour contributed to the significantly higher mineral content, especially magnesium, potassium, iron and copper, in comparison with the control rice cookies ( $p < 0.05$ ). Gluten-free cookies made with rice flour and buckwheat flour exhibited significantly higher total phenolic and rutin content, scavenging activity against 1,1-diphenyl-2-picrylhydrazyl radicals*



(DPPH•), antioxidant activity and reducing power than the control cookies ( $p < 0.05$ ). Comparing all evaluated sensory properties, cookies containing 20 % of light buckwheat flour had the most acceptable sensory properties. The obtained results of principal component analysis showed that the cookies with 20 and 30 % buckwheat flour had better antioxidant and sensory properties in comparison with other two cookie samples.

- J-4.** Živančev, D., Horvat, D., **Torbica, A.**, Belović, M., Šimić, G., Magdić, D., Đukić, N. (2015). Benefits and Limitations of Lab-on-a-Chip Method over Reversed-Phase High-Performance Liquid Chromatography Method in Gluten Proteins Evaluation, Hindawi Publishing Corporation, Journal of Chemistry, Volume 2015, Article ID 430328, 9 pages.

**Кратак приказ рада:**

*RP-HPLC (reversed-phase high-performance liquid chromatography) is widely used to determine*

*the amounts of the different gluten protein types. However, this method is time-consuming, especially*

*at early stages of wheat breeding, when large number of samples needs to be analyzed. On the other hand, LoC (Lab-on-a-Chip) technique has the potential for a fast, reliable, and automatable analysis of proteins. In the present study, benefits and limitations of Lab-on-a-Chip method over RP-HPLC method in gluten proteins evaluation were explored in order to determine in which way LoC method should be improved in order to make its results more compliant with the results of RP-HPLC method. Strong correlation ( $P \leq 0.001$ ) was found between numbers of HMW glutenin peaks determined by LoC and RP-HPLC methods. Significant correlations ( $P \leq 0.05$ ) were obtained between percentages of HMW and LMW glutenin subunits calculated with regard to total HMW + LMW area. Even more significant correlation ( $P \leq 0.001$ ) was found when percentages of individual HMW areas were calculated with regard to total HMW. RPHPLC method showed superiority in determination of gliadins since larger number and better resolution of gliadin peaks were obtained by this method.*

- J-5.** Gubić, J., Milovanović, I., Iličić, M., Tomić, J., **Torbica, A.**, Šarić, Lj., Ilić, N. (2015). Protein and fatty acid fraction of Balkan donkey and human milk. *Mljekarstvo*, 2015, 65(3), 168-176.

**Кратак приказ рада:**

*The aim of this study was to compare the protein and fatty acid fractions of Balkan donkey and human milk in the early lactation stage (40 and 90 day). This study revealed that donkey milk contains s1-casein (1.38-1.89 g/L) and higher concentration of  $\beta$ -casein (0.1-0.55 g/L) in comparison to human milk. The concentration of  $\alpha$ -lactalbumin increased during the lactation phases from 40 to 90 days in both types of milk. Donkey milk contained  $\beta$ -lactoglobulin in low concentrations which decreased to 90th day of lactation. Donkey milk was particularly rich in two whey proteins, lactoferrin and lysozyme, which were found to have molecular weight of approximately 76 kDa and 14.9-15.4 kDa, respectively. The content of lysozyme in donkey milk ranged from 2.39 to 2.97 g/L, while human milk contained 30-50 times lower concentrations of lysozyme in comparison to donkey milk. Thus, donkey milk contained also a higher concentration of lactoferrin (0.012-0.25 g/L) than it was found in the human milk. Lysozyme and lactoferrin content in donkey milk increased during the period from 40th to 90th day of lactation. The percentage of total SFA, MUFA and PUFA was similar in donkey and human milk. The content of essential fatty acids increased during 40-90 days of lactation and was approximately 2.5 times higher in comparison to human milk.*

- J-6.** Tomić, J., **Torbica, A.**, Popović, Lj., Hristov, N., Nikolovski, B. (2016).

Wheat breadmaking properties in dependance on wheat enzymes status and climate conditions. *Food Chemistry*, 199, 565-572.

**Кратак приказ рада:**

*The objective of this study was to evaluate albumins profile, proteolytic and amylolytic activity level and baking performance of wheat varieties grown in two production years with different climate conditions (2011 and 2012) in four locations. The results of ANOVA showed that variety, location, production year, and their interactions all had significant effects on all tested wheat quality parameters. The enzymatic activity and specific bread volume were mainly influenced by the variety. The samples from 2012 production year, had the lower values of albumin content, proteolytic and amylolytic activity, and bread specific volume. The correlation analysis, performed for 2011 production year, showed that albumin fraction (15–30 kDa) and proteolytic activity were negatively correlated with bread specific volume indicating the role of this fraction on lowering the crucial bread quality parameter. In 2012 production year, albumin fractions (5–15 kDa; 50–65 kDa) showed the most correlations, especially with parameters of bread quality.*

- J-7.** Belović, M., Pajić-Lijaković, I., **Torbica, A.**, Mastilović, J., Pećinar, I. (2016). The influence of concentration and temperature on the viscoelastic properties of tomato pomace dispersions. *Food Hydrocolloids*, 61, 617-624.

**Кратак приказ рада:**

*The influence of concentration and temperature on the rheological properties of tomato pomace dispersions obtained by rehydration of lyophilized and grinded tomato pomace was investigated in this paper. Examined systems comprised of different lyophilized tomato pomace concentrations (18.2, 16.7, 14.3, 12.5, 11.1, 10.0, and 9.1%) heat treated at two different temperatures (60 C and 100 C) during 30 min. According to microstructure analysis of the studied system, it could be simplified as the composite consisting of insoluble particles surrounded by the pectin network. The system behaves as viscoelastic solid ( $G_0 > G_{00}$  at all angular velocities), and therefore the static modulus of elasticity, the effective modulus and the damping coefficient were determined by application of modified fractional Kelvin-Voigt model. The influence of particle concentration on the rheological properties of tomato pomace system is dominant in comparison to the content and composition of pectin solubilised in the serum. Concentrated tomato pomace dispersions are much stiffer ( $G_0$  values an order of magnitude higher) than the composite systems. Heat treatment at higher temperature (100 C) decreases the stiffness of the system by breaking of non-covalent bonds between dispersed tomato particles and surrounding pectin network. Storage modulus as a function of the tomato pomace lyophilizate concentration was considered within three regimes (regime 1 - concentration <11.1%; regime 2 - concentration 11.1%-16.7%; regime 3 e concentration >16.7%) that could be used as the base for formulation of tomato pomace-based products with different desirable consistencies, such as sauce, ketchup and marmalade.*

- J-8.** Lončarević, I., Pajin, B., Petrović, J., Zarić, D., Sakač, M., **Torbica, A.**, Lloyd, D.M., Omorjan, R. (2016). The impact of sunflower and rapeseed lecithin on the rheological properties of spreadable cocoa cream. *Journal of Food Engineering*, 171, 67–77, doi:10.1016/j.jfoodeng.2015.10.001

**Кратак приказ рада:**

*The rheological properties of spreadable cocoa cream containing lecithin of different origins (sunflower, rapeseed and soy lecithin) were investigated within this research. A laboratory ball mill was used to produce creams containing varying amounts of lecithin (0.3, 0.5 and 0.7 wt%). The effect of milling time was also studied (between 30, 40 and 50 min). Comparison between the different origins of lecithin revealed sunflower lecithin to be lower in viscosity than soy or rapeseed lecithin. Sunflower and rapeseed lecithins have a higher phosphatidilcholine content than soy lecithin. Increasing the lecithin concentration decreased the crystallization rate and increased the peak and conclusion temperatures in the cream fat phase. The type of lecithin used had no significant influence on the fat phase viscosity. It is found that the optimal rheological properties of*

*spreadable cocoa cream can be achieved using 0.5 wt% of soy and rapeseed lecithin or 0.7 wt% of sunflower lecithin and 40-min milling time.*

- J-9. Torbica, A.,** Belović, M., Mastilović, J., Kevrešan, Ž., Pestorić, M., Škrobot, D., Dapčević Hadnađev, T. (2016). Nutritional, rheological, and sensory evaluation of tomato ketchup with increased content of natural fibres made from fresh tomato pomace. *Food and Bioproducts Processing*, 98, 299-309.

**Кратак приказ рада:**

*The aim of this study was to upgrade the tomato pomace by its conversion into a value added product—ketchup with increased content of natural fibre and optimal sensory properties, produced using standard processing equipment. Fresh tomato pomace was homogenized with other ingredients (water, sugar, salt, vinegar, glucose syrup, xanthan gum, guar gum) at 30 °C, then heated at 60 °C, packed and pasteurized. The end of process was determined according to Bostwick consistency value. Chemical composition, colour and rheological properties were measured at six production steps. Ketchup with increased nutritional value was compared with five commercial products in terms of colour, rheological and sensory properties. Tomato ketchup with increased content of natural fibre contained 3.18 g/100 g of total dietary fibre. Although the rheological properties of ketchup with increased fibre content depend mostly on total solids and insoluble particles content, they remained in the limits of standard tomato products. The obtained results are encouraging in terms of the applied technological process since it resulted in a product with sensory properties more similar to fresh or slightly processed tomato. Flavour, viscosity and colour of ketchup with increased nutritional value could be modified to meet the demands of consumers from different markets.*

- J-10. Torbica, A.,** Drašković, M., Tomić, J., Dodig, D., Bošković, J., Zečević, V. (2016). Utilization of Mixolab for assessment of durum wheat quality dependent on climatic factors. *Journal of Cereal Science*, 69, 344-350.

**Кратак приказ рада:**

*For durum wheat quality assessment the commonly used parameters are protein content, yellow pigment content, hectoliter mass, grain vitreousness, 1000-grain weight and sodium dodecyl sulphate sedimentation. For wheat processing quality, in this study the Mixolab, instrument of a newer generation was used. Mixolab has been largely used for a rapid assessment of the Triticum aestivum quality but there is no a lot of data about durum wheat quality assesment. Therefore, the aim of this work was to test its potential in the quality characterization of fourteen durum wheat breeding lines grown during two production years with different climate conditions. The obtained results showed significant differences in starch-amylase complex part of Mixolab curve between two studied years. Mixolab parameters C3, C4 and C5 were in line with Falling Number values and amyolytic activity of samples. Samples from 2013 production year with higher precipitation sum had lower values of C3, C4 and C5 parameters as well as Falling Number values and higher amyolytic activity. On contrary, protein part of Mixolab curves expressed differences in dependence of genotype. In comparison to the standard parameters of protein and starch quality of durum wheat, Mixolab provides more complete information in a shorter time frame.*

- J-11. Pojić, M.,** Musse, M., Rondeau, C., Hadnađev, M., Grenier, D., Mariette, F., Cambert, M., Diascorn, Y., Quellec, S., **Torbica, A.,** Dapčević Hadnađev, T., Lucas, T. (2016). Overall and Local Bread Expansion, Mechanical Properties, and Molecular Structure During Bread Baking: Effect of Emulsifying Starches. *Food and Bioprocess Technology*, (9), 1287–1305. ISSN: 1935-5149, Springer.

**Кратак приказ рада:**

*In order to determine the relationship betweenmolecular structure of wheat bread dough, its*

*mechanical properties, total and local bread expansion during baking and final bread quality, different methods (rheological, nuclear magnetic resonance, magnetic resonance imaging and general bread characterisation) were employed. The study was extended on wheat dough with starch modified by octenyl succinic anhydride (OSA) in order to generalise the results. The interest of investigating multi-scale changes occurring in dough at different phases of baking process by considering overall results was demonstrated. It was found that OSA starch improved the baking performance during the first phase of baking. This feature was due to a higher absorption of water by OSA starch granules occurring at temperatures below that of starch gelatinization, as confirmed by NMR, and consecutive higher resistance to deformation for OSA dough in this temperature range (20–60 °C). This was explained by a delayed collapse of cell walls in the bottom of the OSA dough. In the second phase of baking (60–80 °C), the mechanism of shrinkage reduced the volume gained by OSA dough during the first phase of baking due to higher rigidity of OSA dough and its higher resistance to deformation. MRI monitoring of the inflation during baking made it possible to distinguish the qualities and defaults coming from the addition of OSA starch as well as to suggest the possible mechanisms at the origin of such dough behaviour.*

- J-12. Torbica, A., Jambrec, D., Tomić, J., Pajin, B., Petrović, J., Kravić, S., Lončarević, I. (2016).** Solid Fat Content, Precrystallization Conditions and Sensory Quality of Chocolate with Addition of Cocoa Butter Analogues. *International Journal of Food Properties*, 19(5), 1029-1043, doi: 10.1080/10942912.2015.1052881.

**Кратак приказ рада:**

*The objective of this study was to determine how the addition of two cocoa butter equivalents and cocoa butter improver affect the physical and sensory properties of chocolate. The laboratory-made chocolate samples were tempered at three different pre-crystallization temperatures (25, 27, and 29°C), using different concentrations (3, 5, and 7%) of two commercial cocoa butter equivalents as well as commercial cocoa butter improver of the chocolate. The nucleation time of the chocolate mass primarily depended on pre-crystallization temperature while the value of maximum torque of chocolate mass were influenced by both, pre-crystallization temperature and concentration of fats. Sensory evaluation revealed that cocoa butter equivalents were acceptable in chocolate formulation without producing a negative impact on the sensory quality, while usage of improver required adjustment of raw formulations or process parameters. The results of the instrumentally measured hardness revealed that addition of cocoa butter improver significantly ( $p > 0.05$ ) increased hardness of chocolate samples.*

- J-13. Živančev, D., Torbica, A., Tomić, J., Janić Hajnal, E., Belović, M., Mastilović, J., Kevrešan, Ž. (2016).** Effect of Climate Change on Wheat Quality and HMW-GS Composition in the Pannonian Plain. *Cereal Chemistry*, 93(1), 90-99.

**Кратак приказ рада:**

*The objective of this study was to determine how the addition of two cocoa butter equivalents and cocoa butter improver affect the physical and sensory properties of chocolate. The laboratory-made chocolate samples were tempered at three different pre-crystallization temperatures (25, 27, and 29°C), using different concentrations (3, 5, and 7%) of two commercial cocoa butter equivalents as well as commercial cocoa butter improver of the chocolate. The nucleation time of the chocolate mass primarily depended on pre-crystallization temperature while the value of maximum torque of chocolate mass was influenced by both, pre-crystallization temperature and concentration of fats. Sensory evaluation revealed that cocoa butter equivalents were acceptable in chocolate formulation without producing a negative impact on the sensory quality, while usage of improver required adjustment of raw formulations or process parameters. The results of the instrumentally measured hardness revealed that addition of cocoa butter improver significantly ( $p > 0.05$ ) increased hardness of chocolate samples. The objective of this study was to determine how the addition of two cocoa butter equivalents and cocoa butter improver affect the physical and sensory properties of chocolate. The laboratory-made chocolate samples were tempered at three different pre-crystallization temperatures (25, 27, and 29°C), using different concentrations (3, 5, and 7%) of two commercial*

cocoa butter equivalents as well as commercial cocoa butter improver of the chocolate. The nucleation time of the chocolate mass primarily depended on pre-crystallization temperature while the value of maximum torque of chocolate mass was influenced by both, pre-crystallization temperature and concentration of fats. Sensory evaluation revealed that cocoa butter equivalents were acceptable in chocolate formulation without producing a negative impact on the sensory quality, while usage of improver required adjustment of raw formulations or process parameters. The results of the instrumentally measured hardness revealed that addition of cocoa butter improver significantly ( $p > 0.05$ ) increased hardness of chocolate samples.

- J-14.** Lončarević, I., Pajin, B., Sakač, M., Zarić, D., Rakin, M., Petrović, J., **Torbica, A.** (2016). You have full text access to this content Influence of rapeseed and sesame oil on crystallization and rheological properties of cocoa cream fat phase and quality of final product. *Journal of Texture Studies*, 47(5), 432-442. DOI: 10.1111/jtxs.12179

**Кратак приказ рада:**

*This research examined spreadable cocoa cream in which fat phase has been modified and analyzed regarding its crystallization and rheological properties and further influence on final product quality. Vegetable fat and refined sunflower oil, as fat phase of spreadable cocoa cream, have been partially substituted with rapeseed and sesame oil, having nutritional and sensory benefits in mind. Substitution of sunflower oil with rapeseed or sesame oil had no influence on cream fat phase viscosity but increased cream viscosity up to 1.7 times and decreased its yield stress up to 2.7 times. Substitution of 70 wt % and total amount of sunflower oil with rapeseed or sesame oil resulted in lower crystallization rate in cream fat phase and the highest sensory scores of final products. Rapeseed and sesame oil have changed and improved the taste of spreadable cocoa cream making it sustainable for use in new products, but with shorter shelf life.*

- J-15.** Gubić, J., Tomić, J., **Torbica, A.**, Iličić, M., Tasić, T., L Šarić, L., Popović, S. (2016). Characterization of several milk proteins in Domestic Balkan donkey breed during lactation, using lab-on-a-chip capillary electrophoresis. *Chemical Industry and Chemical Engineering Quarterly*, 22(1), 9-15.

**Кратак приказ рада:**

*Domestic Balkan donkey (Equus asinus asinus) is a native donkey breed, primarily found in the northern and eastern regions of Serbia. The objective of the study was to analyze proteins of Domestic Balkan donkey milk during the lactation period (from the 45th to the 280th day) by applying lab-on-a-chip electrophoresis. The chip-based separations were performed on the Agilent 2100 Bioanalyzer in combination with the Protein 80 Plus lab chip kit. The protein content of domestic Balkan donkey milk during the lactation period of 280 days ranged from 1.40 to 1.92% and the content of  $\alpha$ 1-casein,  $\alpha$ 2-casein,  $\beta$ -casein,  $\alpha$ -,  $\beta$ -lactoglobulin, lysozyme, lactoferrin and serum albumin was relatively quantified. Lysozyme (1040-2970 mg/L),  $\alpha$ -lactalbumin 12 kDa (1990-2730 mg/L) and  $\alpha$ -lactalbumin 17.7 kDa (2240-3090 mg/L) were found to be the proteins with the highest relative concentrations.*

- J-16.** Belović, M., **Torbica, A.**, Pajić-Lijaković, I., Mastilović, J. (2017). Development of low calorie jams with increased content of natural dietary fibre made from tomato pomace. *Food Chemistry*, 237, 1226-1233. DOI: 10.1016/j.foodchem.2017.06.045

**Кратак приказ рада:**

*In this study, four jam formulations were developed, starting with the basic formulation (Jam 1) containing sucrose and without added pectin. Sucrose was partially (50%) replaced by stevioside in formulations of Jam 2 and 3, while in Jam 4 sucrose was completely replaced by fructose and stevioside, making this formulation suitable for diabetic patients. Jam formulations 1 and 2,*

prepared without added pectin, were thermally stable in the temperature range of 25–90 °C, which indicate their potential use as fruit fillings. Jam formulations 3 and 4 were assessed by the sensory panel as more spreadable since tomato pomace particles are incorporated in pectin network which acts as a lubricant. Jam formulations were characterized by a lower total carbohydrate content (17.23–43.81%) and lower energy value (87.1–193.7 kcal/100 g) when compared to commercial products. Tomato pomace jams contained 15–20 times more dietary fibre than commercial apricot jam.

- J-17.** Pojić, M., Dapčević Hadnađev, T., Hadnađev, M., Rakita, S., **Torbica, A.** (2017). Optimization of additive content and their combination to improve the quality of pure barley bread. *Journal of Food Science and Technology-Mysore*, 54, 579-590. DOI: 10.1007/s13197-016-2435-1

**Кратак приказ рада:**

*The objective of this study was to model the influence of pregelatinized OSA starch (OSA), wheat gluten (Gl) and xylanase (Xyl) on breadmaking potential of barley flour by using response surface methodology. Addition of these ingredients had significant effect on specific bread volume, crust and crumb lightness, crumb texture, average cell size and crumb density. OSA showed the most pronounced effect on specific bread volume, average cell size, crumb density and hardness. Interaction between OSA and Gl, as well as Gl and Xyl, respectively, increased and decreased the specific bread volume and crumb chewiness, while the interaction between OSA and Xyl decreased the specific volume decrease and increased crumb chewiness. An optimal barley bread formulation appeared to be the one containing 9.68% OSA, 2.0% Gl and 4.51 g/100 kg Xyl. This optimal barley bread formulation predicted an increment of 14–28% in volume and a decrease of 105–217% in crumb chewiness in comparison to formulations containing medium amounts of improvers (1% Gl, 5% OSA, 2.5 g/100 kg Xyl).*

- J-18.** Popović, Lj., Stolić, Ž., Čakarević, J., **Torbica, A.**, Tomić, J., Šijački, M. (2017). Biologically Active Digests from Pumpkin Oil Cake Protein: Effect of Cross-linking by Transglutaminase. *Journal of the American Oil Chemists' Society*, 94, 1245-1251. DOI: 10.1007/s11746-017-3041-8

**Кратак приказ рада:**

*The objective of this study was to show that biologically active hydrolysates can be obtained by simulated human gastrointestinal digestion (HGD) of transglutaminase cross-linked pumpkin oil cake protein (Tg-C) which was previously reported as a potential functional food additive. A two-stage in vitro digestion model system (by pepsin and  $\alpha$  chymotrypsin and trypsin, simultaneously) was used to simulate the process of HGD on native and Tg-C major storage pumpkin oil seed/cake protein, cucurbitin (C). The biologically active potential of the digests was evaluated, measuring the angiotensin-converting-I enzyme (ACE) inhibitory and anti-oxidant capacity. The ACE inhibitory activity was determined in both final digests, with  $IC_{50} = 0.30 \pm 0.04$  mg/ml for C and  $IC_{50} = 0.28 \pm 0.01$  for Tg-C. The anti-oxidant potency of the examined proteins was enhanced by the digestion process. The 2,2-diphenyl-1-picrylhydrazyl and 2,2-azino-bis(3-ethylbenzothiazoline-6-sulphonic acid) radical cation activities and reducing power testing showed that all the hydrolysates act as a radical quencher and reducing agents. Overall, the results showed that the cross-linking by Tg did not influence the digestion process, as well as having no effect on the biological activity of the hydrolysates. These also indicate that Tg-C, if used as functional food additive, after food consumption can be digested and become a source of peptides exerting positive effects on human health.*

- J-19.** **Torbica, A.**, Horvat, D., Živančev, D., Belović, M., Šimić, G., Magdić, D., Đukić, N., Dvojković, K. (2017). Prediction of the genetic similarity of wheat and wheat quality by Reversed-Phase High-Performance liquid Chromatography and Lab-on-Chip methods. *Acta Alimentaria*, 46, 137-144. DOI:

10.1556/066.2016.0003

**Кратак приказ рада:**

The aim of this study was to compare efficiency of RP-HPLC (Reversed-Phase High-Performance Liquid Chromatography) and LOC (Lab-on-Chip) methods for wheat gluten protein quantification regarding clustering of wheat cultivars according to the genetic similarity (HMW-GS combinations), as well as to explore relations of these two methods to wheat quality parameters. For that purpose, wheat quality parameters (protein content, falling number, wet gluten content, gluten index, Farinograph, Extensograph, and Amylograph), as well as amounts of gliadin and glutenin fractions by RP-HPLC and LOC methods were determined in two different sets of wheat cultivars (Croatian and Serbian). The percentages of gluten proteins and the values of quality parameters were used to characterize the samples by principal component analysis (PCA). Gluten protein quantification performed by method based on the protein fraction separation by molecular weights (LOC) was better for grouping of genetically similar wheat cultivars than quantification of proteins separated by their different solubility in specified solvent gradient (RP-HPLC). LOC method showed higher potential in wheat quality prediction.

- J-20.** Lončarević, I., Fišteš, A., Rakić, D., Pajin, B., Petrović, J., **Torbica, A.**, Zarić, D. (2017). Optimization of the ball mill processing parameters in the fat filling production. Chemical Industry and Chemical Engineering Quarterly, 23(2), 197-206. DOI: 10.2298/CICEQ151217031L

**Кратак приказ рада:**

The aim of this study was to determine the effect of the main milling variables, i.e., agitator shaft speed (50, 75 and 100%, which is 25, 37.5 and 50 rpm) and milling time (30, 45 and 60 min) on physical and sensory properties of fat filling, as well as on energy consumption during the production in a laboratory ball mill. Within the response surface method, the face centered central composite design is used. A response surface regression analysis for responses was performed and a full quadratic model was fitted to the experimental data. It is shown that agitator shaft speed had the most significant influence on physical properties (particle size distribution, rheological and textural properties) and sensory characteristics of fat filling, while the milling energy consumption is highly influenced by milling time with contribution 55.4%, followed by agitator shaft speed (40.04%). The model obtained by regression analyses was used to perform the optimization of processing parameters in order to provide the combination of agitator shaft speed and milling time that cost less energy while at the same time do not compromise the quality of the fat filling. Optimization of production of fat filling in a laboratory ball mill would imply the maximum agitator shaft speed and 30-min milling time.

- J-21.** Savanović, D., Grujić, R., Rakita, S., **Torbica, A.**, Božičković, R. (2017). Melting and crystallization DSC profiles of different types of meat. Chemical Industry and Chemical Engineering Quarterly, 23(4), 473-481. DOI: 10.2298/CICEQ160707001S

**Кратак приказ рада:**

The aim of this study was to test the influence of scanning rate and meat type on the thermo-physical properties of meat and content of the freezable water in frozen meat, using differential scanning calorimetry (DSC). In this study, three types of meat were investigated: beef (*M. Longissimus dorsi*), pork (*M. Longissimus dorsi*), and chicken meat (*Pectoralis major*). The cooling rate affected the onset ( $T_{c,on}$ ), peak ( $T_c$ ) and end ( $T_{c,end}$ ) temperatures of crystallization process of beef meat ( $p < 0.05$ ). Decreasing cooling rate from 20 to 2 °C/min resulted in significant ( $p < 0.05$ ) change of the crystallization enthalpy ( $\Delta H_c$ ) of beef meat, from -220.17 to -168.20 J/g, respectively. Reduction of the heating rate caused significant ( $p < 0.05$ ) decrease in enthalpy of melting ( $\Delta H_m$ ) for beef meat, from 228.87 to 161.13 J/g. The heating rate affected the peak ( $T_m$ ) and end temperatures ( $T_{m,end}$ ) of melting process of beef meat ( $p < 0.05$ ). The type of meat did not have effect on  $\Delta H_c$  and  $\Delta H_m$  as well as temperature of crystallization ( $T_{c,on}$ ,  $T_c$  and  $T_{c,end}$ ) and temperature of melting ( $T_m$  and

$T_{m\text{end}}$ ) in meat. Significant ( $p < 0.05$ ) change in freezable water content were recorded between heating rate 20 °C/min and other heating rates, for all three meat types.

- J-22.** Belović, M., Torbica, A., Pajić Lijaković, I., Tomić, J., Lončarević, I., Petrović, J. (2018). Tomato pomace powder as a raw material for ketchup production. Food Bioscience, 26, 193–199. DOI: 10.1016/j.fbio.2018.10.013

**Кратак приказ рада:**

*A value-added ketchup from tomato pomace powder was developed and compared to a previously developed ketchup from fresh tomato pomace. The total dietary fiber content of tomato pomace powder ketchup was higher than fresh tomato pomace ketchup due to the production process in which no seeds were removed. Differences in processing led to larger specific surface area of rehydrated tomato pomace powder particles when compared to fresh tomato pomace particles and consequently their larger bonding affinity to polysaccharides. The pomace powder ketchup had a significantly higher yield stress and pronounced thixotropy in comparison with fresh tomato pomace ketchup that could not be packed into tubes. Additionally, improved thermal stability of ketchup prepared from tomato pomace powder suggested its possible application as a bakery filling. However, this promising procedure requires more expensive processing equipment and higher energy consumption than fresh tomato pomace processing.*

- J-23.** Rakita, S., Dokić, Lj., Dapčević Hadnađev, T., Hadnađev, M., Torbica, A. (2018). Predicting rheological behavior and baking quality of wheat flour using a GlutoPeak test. Journal of Texture Study, 49(3), 339-347. DOI: 10.1111/jtxs.12308

**Кратак приказ рада:**

*The purpose of this research was to gain an insight into the ability of the GlutoPeak instrument to predict flour functionality for bread making, as well as to determine which of the GlutoPeak parameters show the best potential in predicting dough rheological behavior and baking performance. Obtained results showed that GlutoPeak parameters correlated better with the indices of extensional rheological tests which consider constant dough hydration than with those which were performed at constant dough consistency. The GlutoPeak test showed that it is suitable for discriminating wheat varieties of good quality from those of poor quality, while the most discriminating index was maximum torque (MT). Moreover, MT value of 50 BU and aggregation energy value of 1,300 GPU were set as limits of wheat flour quality. The backward stepwise regression analysis revealed that a high-level prediction of indices which are highly affected by protein content (gluten content, flour water absorption, and dough tenacity) was achieved by using the GlutoPeak indices. Concerning bread quality, a moderate prediction of specific loaf volume and an intense level prediction of breadcrumb textural properties were accomplished by using the GlutoPeak parameters. The presented results indicated that the application of this quick test in wheat transformation chain for the assessment of baking quality would be useful. Practical applications Baking test is considered as the most reliable method for assessing wheat-baking quality. However, baking test requires trained staff, time, and large sample amount. These disadvantages have led to a growing demand to develop new rapid tests which would enable prediction of baked product quality with a limited flour size. Therefore, we tested the possibility of using a GlutoPeak tester to predict loaf volume and breadcrumb textural properties. Discrimination of wheat varieties according to quality with a restricted flour amount was also examined. Furthermore, we proposed the limit values of GlutoPeak parameters which would be highly beneficial for millers and bakers when determine suitability of flour for end-use.*

- J-24.** Šekularac, A., Torbica, A., Živančev, D., Tomić, J., Knežević, D. (2018). The influence of wheat genotype and environmental factors on gluten index and the possibility of its use as bread quality predictor. Genetika, 50 (1), 85-93. DOI: 10.2298/GENSR1801085S

**Кратак приказ рада:**



*Gluten index is an indicator of gluten strength as well as a parameter which simultaneously defines its quantity and quality. If compared to the farinographic and extensographic methods, gluten index determining is faster, less complicated and requires smaller amount of flour. The aim of this study has been to determine the significance of the influence of genotype and environmental factors on the value of gluten index and usability of these parameters as indicators and predictors of bread quality. Five local varieties of winter wheat (Simonida, NS 40S, Rapsodija, Pobeda, Zvezdana) were grown in a macro-experiment carried out in three locations (Novi Sad, Čačak, Sombor) during two seasons (2011/2012 and 2012/2013). Gluten index value determination was achieved by using ICC standard method 155 (1996), with a slight modification that included mechanical washing of gluten (Theby). Statistical analysis was performed by using IBM SPSS Statistics 20. Variance analysis revealed a statistically significant effect of genotype on gluten index value, whereas the influence of environmental factors, as well as the interaction of two factors, had no statistical significance. There was no correlation between the values of gluten index and meteorological factors such as average temperature and total precipitation during the phenophase of grain filling, and in the period from the beginning of flowering until the harvest. However, medium-strong negative dependence was found between gluten index and the index of heat stress, as well as between gluten index and the number of days with temperatures above 30°C. Weak negative dependence was recorded between gluten index and bread volume. Based on the value of gluten index, gluten varieties used in our study can be described as strong. Genotype proved to be the only cause of statistically significant variation of gluten index.*

- J-25.** Tomić, J., **Torbica, A.**, Belović, M., Popović, L. Knežević, N. (2018). Biochemical Quality Indicators and Enzymatic Activity of Wheat Flour from the Aspect of Climatic Conditions. Journal of Food Quality, Article ID 5187841, 9 pages. DOI: 10.1155/2018/5187841

**Кратак приказ рада:**

*Te contents of free sulphhydryl groups (SH), disulphide bonds (SS), and free amino groups (NH<sub>2</sub>) were determined in order to estimate the extent of climatic condition influence on gluten quality. Te analysis included four bread wheat varieties grown in two production years (2011 and 2012) with*

*different climatic conditions in different locations. According to our previously reported results, the*

*working hypothesis was that enzyme activity for breadmaking purpose was insufficient. Te aim of this paper was to study the influence of naturally present enzymes on the bread quality by the addition of previously extracted and freeze-dried albumins to the base flour as an additive. Te selection of*

*samples was made on the basis of different combinations of proteolytic and  $\alpha$ -amylolytic enzymes*

*activity levels. For samples from 2012 production year, the content of SH groups was significantly higher. Regarding the SS content, the obtained results exhibited the opposite trend. Variations in NH<sub>2</sub> content were dominantly caused by temperature treatment of tested samples. Te addition of freeze-dried albumins to bread improved its specific volume in a lesser extent, while bread crumb texture was significantly improved.*

- J-26.** **Torbica, A.**, Belović, M., Tomić, J. (2019). Novel breads of non-wheat flours. Food Chemistry, 282, 134-140. DOI: 10.1016/j.foodchem.2018.12.113

**Кратак приказ рада:**

*The aim of this study was to provide new approach in creating gluten-containing and gluten-free breads without additives by combining thermal and hydrothermal pretreatments of flours (rye, oat,*

sorghum and millet). The applied methodology included determinations of chemical composition of flours and breads, water absorption index, empirical and fundamental rheological measurements, and scanning electron microscopy, differential scanning calorimetry, colour, textural and sensory evaluations of breads. Novel rye, oat, sorghum and millet breads based on the blend of heat treated and extruded corresponding flours in ratio 70:30 were produced by conventional breadmaking process. All breads were characterized by increased fibre content and had appearance similar to common wheat bread. Gluten-free breads were harder, less elastic with more granular structure due to higher degree of starch crystallinity. Mixolab curves indicated on many possible ways for further breads optimisation.

- J-27. Torbica, A., Škrobot, D., Janić Hajnal, E., Belović, M., Zhang, N. (2019).** Sensory and physico-chemical properties of wholegrain wheat bread prepared with selected food by-products. *LWT - Food Science and Technology*, 114, Article number 108414. DOI: 10.1016/j.lwt.2019.108414

**Кратак приказ рада:**

*Enrichment of bread with dietary fibres from food industry by-products is an interesting way to increase consumers' fibres intake on one side, and to decrease by-products on the other side. The objective of this study was to investigate the possibility of using brewers' spent grain, sugar beet pulp and apple pomace for value added bread production. For the purpose, selected by-products were mixed with corn grits, extruded and co-extrudates were used for substitution of 10 or 20% of wholegrain wheat flour in bread formulations. Dough rheological and bread physico-chemical (nutritional profile, colour, texture and volume) properties, sensory characteristics and consumer preferences and acceptance of breads were analysed. Developed breads were characterized by increased total dietary fibre content, while their protein content was unchanged when compared to wholegrain wheat bread. The breads classification based on the correspondence analysis indicated similarities in control and bread containing apple pomace, characterized them with positive feelings and sensory attributes related to taste, although descriptive sensory analysis showed significant differences in taste overall intensity between these two samples.*

- J-28. Djukić, N., Knežević, D., Pantelić, D., Živančev, D., Torbica, A., Marković, S. (2019).** Expression of protein synthesis elongation factors in winter wheat and oat in response to heat stress. *Journal of plant physiology*, 240, 153015.

**Кратак приказ рада:**

*The aim of our work was to examine the expression and accumulation of EF-Tu and eEF1A in grain fling stage of five genotypes of winter wheat and one oat genotype in conditions of heat stress. In addition, the correlation between accumulation of elongation factors eEF1A and EF-Tu, and yield components of cereals in the field was investigated. Flag leaf protein samples were analyzed by immunoblotting. Flag leaves were collected under conditions of moderate (23 °C; MT) and high air temperature (38 °C; HT) in a field experiment. After the harvest, grain yield was determined. The yield components, the weight of dry seed and grains number per spike, were assessed in the stage of full physiological maturity of investigated cultivars. Obtained results revealed a difference in the level of EF-Tu accumulation both under conditions of moderate air temperatures and conditions of heat stress among investigated cultivars. Cultivar Zvezdana was the only one that showed increase in EF-Tu accumulation under HT (25%) compared to MT. Immunoblot analysis indicated that the highest increase of eEF1A accumulation (43%) in relation to moderate temperature was detected in cultivar Talas. A significant, positive, linear correlation was found between the expression of eEF1A and small grains productivity under heatstress conditions.*

- J-29. Torbica, A., Mocko Blažek, K., Belović, M., Janić Hajnal, E. (2019).** Quality prediction of bread made from composite flours using different parameters of empirical rheology. *Journal of Cereal Science*, 89, Article 102812. DOI: 10.1016/j.jcs.2019.102812

**Кратак приказ рада:**

*The aim of this study was to explore the possibility of predicting quality of bread from composite flours on the basis of empirical rheological parameters. Composite flours were contained wheat flour partially substituted (10 and 30%) by flours of durum wheat, rye, triticale, barley, oat, millet and sorghum. Dough rheological properties of all composite flours were determined using Farinograph, Mixolab and Micro-doughLAB. Breadmaking was conducted at two mixing speeds and two fermentation times. Farinograph stability and dough development time can be used to predict bread quality at lower level of substitution (10%). C2 point by Mixolab can be used to predict specific volume of bread in all conditions. PCA performed on Mixolab parameters showed grouping of samples by culture used for substitution of wheat flours. Based on Mixolab results it can be concluded that this device is more sensitive to the separation of the samples by culture, compared to the Farinograph. Most of the Micro-doughLAB parameters of high mixing speed could predict quality of bread prepared using high speed mixer at both fermentation regimes and both levels of substitution.*

- J-30.** Pestorić, M., Mastilović, J., Pezo, L., Belović, M., Škrobot, D., Šimurina, O., Filipčev, B., Pojić, M., **Torbica, A.** (2019). Prediction of commercial spaghetti quality based on sensory and physicochemical data. *Journal of Food Processing and Preservation*, 43(11), Article number e14172, 1-8 DOI: 10.1111/jfpp.14172

**Кратак приказ рада:**

*In this paper, a range of nine commercial spaghetti samples was studied to compare and describe relationships between physicochemical and sensory data. Analysis of variance showed that all*

*examined sensory and physicochemical properties were significant ( $p < .05$ ) in discriminating the*

*samples, which could support the usefulness of their application in characterizing the spaghetti appearance quality. According to the results of sensory analysis, the samples were differentiated into four significantly different quality groups, regarding the overall appearance of the samples, as well as all individually evaluated attributes. Successful rating of the appearance quality of commercial spaghetti can be conducted on the basis of instrumental determinations, in the first place using color and mechanical characteristics. Principal component analysis was used to discriminate groups of samples according to similarity in physicochemical and sensory parameters, and the first two principal components explained 75.04% of the total variance of samples. Practical application This work can be useful for manufacturers and technologists in the pasta production sector, who wish to improve the performance of their productive and quality control process in order to satisfy consumer demands and expectations of spaghetti. The selected physicochemical parameters could be used in future studies to evaluate various production samples of dried spaghetti by establishing models and investigating the predictability of sensory appearance quality.*

- J-31.** Šojić, B., Pavlić, B., Tomović, V., Kocić-Tanackov, S., Đurović, S., Zeković, Z., Belović, M., **Torbica, A.**, Jokanović, M., Uromović, N., Vujadinović, D., Ivić, M., Škaljac, S. (2020). Tomato pomace extract and organic peppermint essential oil as effective sodium nitrite replacement in cooked pork sausages. *Food Chemistry*, 127202. DOI: 10.1016/j.foodchem.2020.127202

**Кратак приказ рада:**

*The effect of supercritical fluid extract of tomato pomace (TP) and essential oil of organic peppermint (PM) on pH, color, residual nitrite content, lipid oxidation (TBARS value) and total plate count (TPC) of cooked pork sausages produced with 50 mg/kg of sodium nitrite was investigated. Five batches were produced: T1: 100 mg/kg of sodium nitrite; T2: 50 mg of sodium nitrite; T3: 50 mg of sodium nitrite and 0.150  $\mu$ L/g TP; T4: 50 mg of sodium nitrite, 0.075  $\mu$ L/g TP and 0.075  $\mu$ L/g PM; T5: 50 mg of sodium nitrite and 0.150  $\mu$ L/g PM. The lowest residual nitrite content and TBARS value were observed in treatment T4. The inclusion of TP increased redness of cooked pork*

sausages. TPC was the lowest in treatment T5. The results of this study showed that the addition of TP and PM enhanced quality of cooked sausages produced with reduced level of sodium nitrite.

- J-32.** Živančev, D., Jocković, B., Mladenov, N., **Torbica, A.**, Belović, M., Mijić, B., Ninkov, J. (2020). The effects of wheat cultivars on the production of different types of wheat flours of precisely defined magnesium content. *Chemical Industry and Chemical Engineering Quarterly*, 26(1), 1-7. DOI: 10.2298/CICEQ181004019Z

**Кратак приказ рада:**

Whole kernels of cereals are the most important source of magnesium. This mineral has several positive effects on human health. However, the human body cannot absorb 100% of magnesium from plant sources during digestion. Additionally, the wheat flour milling process usually produces refined flour with a substantially lower content of magnesium. The aim of this study was to examine the effect of milling of two wheat cultivars on total and soluble magnesium distribution in milling fractions, with the purpose of creating wheat bread with a precisely defined magnesium content. Ash content, thousand grain weight (TGW), and kernel size were analysed in five wheat cultivars. Two most statistically distinguished wheat cultivars according to these analyses (Moma and Todorka) were milled in a laboratory mill to gain as many flour fractions as possible (eleven). Magnesium was extracted from the flour and its content was measured by inductively coupled plasma. The results showed that the level of soluble magnesium in refined white flours (T-500 with ash content between 0.46-0.60 d.m.%) is approximately 17% and is available for uptake in the human body. Also, by milling the Moma cultivar in an industrial mill with a capacity of 100 t per day gave 6.6 t more brown flour (T-1000 with ash content between 1.05-1.15 d.m.%) than the Todorka cultivar. Furthermore, the daily consumption of brown bread (produced from brown flour) in Serbia would satisfy about 60% of the daily magnesium requirements.

- J-33.** Tomić, J., **Torbica, A.**, & Belović, M. (2020). Effect of non-gluten proteins and transglutaminase on dough rheological properties and quality of bread based on millet (*Panicum miliaceum*) flour. *LWT*, 118, 108852. DOI: 10.1016/j.lwt.2019.108852

**Кратак приказ рада:**

In this study, gluten-free bread was created by substitution of millet flour with proteins from different sources at level of 10% (pea, rice and whey protein concentrate), in order to analyse their potential as a techno-functional component. In addition, the effect of different concentrations of transglutaminase (0.5, 1.0 and 1.5% w/w based on the flour-protein blends) on dough rheological properties and bread textural and sensory quality was investigated. Besides the nutritional benefit, the incorporation of proteins improved technological quality of millet bread, including structure strengthening, specific volume increase and sensory quality. The effect of transglutaminase was in a certain extent masked by the high amount of protein concentrates. The highest value of specific volume was obtained for millet breads with whey proteins. Overall, the substitution of millet flour by pea, rice and whey proteins caused significant reduction of bread hardness and complete loss of bitter taste originating from millet.

- J-34.** **Torbica, A.**, Belović, M., Popović, L., Čakarević, J., Jovičić, M., Pavličević, J. (2020). Comparative study of nutritional and technological quality aspects of minor cereals. *Journal of Food Science and Technology*, 1-12. DOI: 0.1007/s13197-020-04544-w

**Кратак приказ рада:**

In order to have a better insight into the quality of minor cereals, the aim of this research was to evaluate the nutritional, biochemical, physical and rheological properties of barley, rye, triticale, oat, sorghum and millet flours. Generally, all flours could be divided into two groups according to mineral content, x-6/x-3 fatty acids ratio and amino acid composition. Sorghum flour was characterized by the highest total phenolic content and was the only flour which contained

*detectable amounts of tannins. Sorghum and millet flours differed from other flours by lower water absorption index and higher temperature of starch gelatinization. Additionally, sorghum and millet flours could be analysed by Mixolab only using constant hydration and require more time to obtain complete hydration than other flours. All flours would require modification of standard breadmaking process in order to obtain quality of product similar to those already present at the market.*

- J-35. Torbica, A., Belović, M., Popović, Lj., Čakarević, J. (2021).** Heat and hydrothermal treatments of non-wheat flours. *Food Chemistry*, 334, 127523. DOI: 10.1016/j.foodchem.2020.127523

**Кратак приказ рада:**

*Non-wheat cereals have become popular in the diet due to their nutritional benefits, but their application is limited by properties of their proteins. Some of these flours can be conventionally processed, but the final products are not of acceptable quality. Modification of physico-chemical properties of non-wheat flours by dry heat and extrusion represent the alternative process which can transform the flours into an adequate raw material for the bakery and confectionery industry. The aim of this study was to determine the type and extent of physico-chemical changes in modified flours whose mixtures were used successfully for bread production. Extrusion had stronger influence on chemical composition of flours than dry heating, especially on the content of fats and phenolic compounds. Extrusion also increased starch digestibility due to complete gelatinization process, making it almost equal for all flours. On the other hand, protein digestibility depends mostly on botanical origin of flour.*

**II Објављени радови у часопису националног значаја, R62:**

- J-1. Živančev, D., Torbica, A., Momčilović, V., Mastilović, J. (2017).** Impact of Genetic and Climatic Factors on Parameters of Breadmaking Quality of Wheat Kernel and Flour Starch Component. *Ratarstvo i Povrtarstvo*, 54(3), 93-98. doi:10.5937/ratpov54-14025

**Кратак приказ рада:**

*This study investigates how genetic and climatic factors affect parameters of breadmaking quality of wheat kernel and flour starch component. Nine wheat cultivars with different combinations of HMW-GS were grown in three production years. Various rheological devices such as Falling Number (FN), Farinograph, Amylograph, Mixolab and SDmatic were used for characterization of milled wheat samples. The most results showed that climatic factors affected parameters of breadmaking quality of wheat kernel and flour starch component more than HMW-GS composition. However, some results of the bread making quality parameters that are considered to be very reliable indicators of changes in starch component of wheat in wet years, such as FN and maximum peak of viscosity by Amylograph, were dependent of HMW-GS composition.*

- J-2. Tomić, J., Torbica, A., Belović, M., Popović, Lj., Čakarević, J., Savanović, D., Novaković, A., Mocko Blažek, K. (2018).** Potential of pumpkin oil cake protein isolate in production of millet bread. *Food and Feed Research*, 45 (2), 139-147. DOI: 0.5937/FFR1802139T

**Кратак приказ рада:**

*The objective of this study was to evaluate the potential of pumpkin oil cake protein isolate in production of millet bread. For that purpose, breads were created by substitution of millet flour with proteins at 5, 10 and 15% level. Dough rheological properties and both physical and sensory characteristics of obtained bread were determined. The increase in pumpkin oilseed cake protein (POCP) concentration influenced increase in dough viscosity, as determined using farinograph and fundamental rheological measurements. This is additionally confirmed by lower elasticity of supplemented breads as determined by texture analysis and sensory panel. Substitution of millet flour with POCP at all tested levels did not exhibit any influence on bread specific volume. However,*

24 h after baking, breads supplemented with higher amount of POCP showed less pronounced hardening of the crumb, indicating that these proteins might retard starch retrogradation. The supplementation of millet bread with POCP had several beneficial effects on the sensory quality of bread, such as loss of bitter taste and aftertaste originating from millet flour. Additionally, bread granularity decreased and bread dissolving speed in mouth increased along with the increase in POCP concentration.

- J-3. Torbica, A., Tomić, J., Savanović, D., Pajin, B., Petrović, J., Lončarević, I., Fišteš, A., Mocko Blažek, K. (2018).** Utilization of apple pomace coextruded with corn grits in sponge cake creation. *Food and Feed Research*, 45 (2), 149-157. DOI: 10.5937/FFR1802149T

**Кратак приказ рада:**

Apple pomace, a by-product that remains after extraction of juice from fruit, is a good source of dietary fibre, minerals and different phytochemicals such as phenolic acids. Although the valorization of apple pomace as a bakery ingredient was performed by several authors, there is a lack of information on attempts of incorporation of apple by-products in the form of coextrudates with corn grits (CAPCG). In this study, sponge cakes were created with apple pomace coextruded with corn grits in the ratio of 45:55 by partial replacing wheat flour with coextrudate in the formulation at 10%, 20% and 30% level. With the increase in the proportion of coextruded particles, the farinographic characteristics of dough samples showed an increase in water absorption and dough development time due to larger particles of coextrudates, and loss of dough elasticity. Consequently, the cake specific volume decreased over the range between 3.6 - 14.2%, but only the substitution level of 30% yielded an increase in cake firmness after 1 h of cooling and after 24 h of storage. The estimation of sponge cake sensory properties using the hedonic scale from 1 to 9 showed that the most acceptable texture was found in the control sample, whereas all sponge cakes with CAPCG had significantly higher acceptance of odour and taste in comparison to the control cake. From the nutritional point of view, sponge cakes substituted with CAPCG showed higher total dietary fibre content than the control wheat sponge cake.

- J-4. Novaković, A. R., Karaman, M. A., Milovanović, I. LJ., Torbica, A. M., Tomić, J. M., Pejcin, B. M., Sakač, M. B. (2018).** Nutritional and phenolic profile of small edible fungal species *Coprinellus disseminatus* (Pers.) J.E. Lange 1938. *Food and Feed Research*, 45(2), 119-128. DOI: 10.5937/FFR1802119N

**Кратак приказ рада:**

The aim of this work was to investigate nutritional profile in relation to proteins, amino acids, fatty acids and mineral composition, as well as phenolic profile of small edible fungal species *Coprinellus disseminatus* originated from Serbia. Total protein content in the analyzed fungal species was 9.72%. Fifteen protein fractions obtained by electrophoresis were identified in a range from 1.6 to 63.6 kDa. Chip-based separations showed the presence of protein fraction with molecular weight of 27.5 kDa that could possess antifungal activity. The total essential and non-essential amino acid contents were 29.57 and 96.69 mg/g DW, respectively. Among the essential amino acids, leucine was the most abundant. Fatty acid composition of *C. disseminatus* showed that polyunsaturated fatty acids (PUFA, 59.1% of total FA) predominated over saturated fatty acids (SFA, 23.1% of total FA) and monounsaturated fatty acids (MUFA, 17.9% of total FA). The dominant fatty acids were linoleic acid (56.6%), palmitic acid (13.9%), and oleic acid (12.0%). The most abundant macroelement in *C. disseminatus* was potassium, followed by calcium and magnesium, while iron dominated in microelements. Eight phenolic compounds were quantified in methanolic extract of *C. disseminatus* by LC-MS/MS with the highest amount of *p*-hydroxybenzoic acid and *p*-coumaric acid reaching  $9.46 \pm 0.2 \mu\text{g/g DW}$  and  $7.8 \pm 0.1 \mu\text{g/g DW}$ , respectively.

- J-5. Belović, M., Torbica, A., Škrobot, D., Tomić, J., Čabarkapa, I., Živančev, D., Štatkić, S., Aćin, V., Kukurová, K., Ciesarová Z. (2020).** Potential application of triticale cultivar 'Odisej' for the production of cookies. *Ratarstvo i povrtarstvo*,

57(1), 8-13. DOI: 10.5937/ratpov57-24126

**Кратак приказ рада:**

*Triticale, a hybrid cereal developed by crossing of wheat and rye, has certain advantages over wheat, such as higher environmental tolerance and higher content of dietary fibers. The application of triticale flour in food industry is limited by poor rheological properties of dough and low gluten strength. Potential application of the hexaploid triticale cultivar — “Odisej” for the production of cookies was assessed in this study. Additionally, the values of basic grain quality parameters for —Odisej□ were determined, such as hectoliter weight, thousand kernel weight, grain size, protein and wet gluten content, gluten index and falling number. Cookies were prepared from refined and wholegrain triticale flour and their physical properties (dimensions, color, and hardness) and sensory properties were compared to the cookies prepared from refined and wholegrain wheat and rye flour. Cookies manufactured from the refined triticale flour had high spread ratio (diameter/high) value, similar to that of cookies prepared from refined wheat flour. Total sensory score of the cookies manufactured from refined triticale flour was the highest among all samples, indicating that it can successfully be used in cookies production. The quality of wholegrain triticale cookies could be improved by the use of milling technique adequate for the production of wholegrain flour.*

**Ш Књиге, монографије и уџбеници:  
Универзитетски уџбеник са рецензијом**

**Б-1** Pajin, B., Torbica, A., **Namenske masti za konditorsku i pekarsku industriju**, Tehnološki fakultet Novi Sad, Univerzitet u Novom Sadu, 2020, 206 str., ISBN 978-86-6253-070-7.

**Кратак приказ књиге**

*Масли и уља се у целом свету користе како у исхрани, тако и за индустријске потребе. Глобална производња биљних уља непрекидно расте од почетка 20 века, а у 2015/2016. години достигла је вредност од 179,56 милиона метричких тона. Масли и уља су широко распрострањена једињења у биљном и животињском свету, а њихова улога у људском организму је есенцијална, јер представљају значајан извор енергије и носиоце виталних нутријената. У прехранбеној индустрији масли су вишеструко заступљене, будући да доприносе формирању карактеристичних физичких и сензорских својстава прехранбених производа.*

*Биљне масли, које се користе у кондиторској пекарској индустрији, својим хемијским и физичким својствима, као и физиолошком улогом, значајно утичу на понашање током прераде, као и на квалитет готовог производа.*

*Масли које се најчешће користе у производњи чоколаде, крем производа, разних врста масних пуњења и кекса међусобно се разликују по својим физичким особинама које диктирају и дефинишу њихово кристализационо понашање, реолошке особине и квалитет готовог производа.*

*У наменске масли за пекарску индустрију се убрајају шортенинзи и маргарини. Шортенинзи и маргарини су посебно креирани системи масли чија функционална својства имају за циљ да испуне специфичне потребе потрошача или да се уграде у производ жељеног, односно одговарајућег квалитета. Првобитне карактеристике масли и уља из којих се добијају шортенинзи и маргарини се модификују како би се обезбедила жељена конзистенција и очувао квалитет готовог производа. Овако модификоване масли имају посебну функционалност при употреби за печење (пржење), у производњи пекарских производа као и за кување. С обзиром на то да маргарини и шортенинзи спадају у најфлексибилније основне прехранбене састојке, очекује се да ће њихова употреба наставити да расте. Такви модификовани системи масли морају да задовоље низ захтева у погледу физичке функционалности и здравствених/ нутритивних потреба. Ови захтеви су често у супротности једни са другима. У том смислу можда је најважније истаћи да је за постизање жељене конзистенције (један од најважнијих физичких параметара квалитета)*

*готово немогуће избећи присуство потенцијално штетних хидрогенованих масли. Производња шортенинга се у суштини базира на понашању (пре свега кристализационом) одговарајуће полазне масли и уља које се морају модификовати да би се произвели шортенинзи жељених карактеристика. Физичке карактеристике које се очекују од разних врста шортенинг система (особине топљења, конзистенција, чврстоћа и пропустљивост мреже) обезбеђују присутне чврсте кристализоване*

мреже масти. Међутим, с обзиром на свеобухватност изложене материје и начина приказа овај материјал такође представља вредан ресурс осталим академским и научноистраживачким установама и у виду приручника може послужити произвођачима кондиторских производа у бољем разумевању процеса током њихове производње.

Уџбеник се састоји, поред Увода и Прилога, из неколико главних делова :

I ОПШТЕ КАРАКТЕРИСТИКЕ МАСТИ

II НАМЕНСКЕ МАСТИ ЗА КОНДИТОРСКУ ИНДУСТРИЈУ

III НАМЕНСКЕ МАСТИ ЗА ПЕКАРСКУ ИНДУСТРИЈУ

IV ЕМУЛГАТОРИ

V МЕТОДЕ ДЕФИНИСАЊА НАМЕНСКОГ КВАЛИТЕТА МАСТИ И ГОТОВИХ ПРОИЗВОДА

У Првом поглављу су приказана општа, хемијска и физичка својства масти као и њихове кристализационе особине као важни фактори који одређују понашање масти током прераде. Друго поглавље се бави наменским мастима за кондиторске производе, односно даје увид у својства и примену какао маслаца, масти аналогних какао маслацу, масти за масна пуњења, палмину маст и млечну маст. У Трећем поглављу су приказане карактеристике наменских масти за пекарску индустрију и то пре свега маргарини и шортенинзи. Четврто поглавље је посвећено емулгаторима као неопходним компонентама стабилности система и то моно- и диглицеридима, фосфолипидима, полиглицерол естрима, сорбитан естрима и полисорбатима. Посебан део ове књиге заузима Пето поглавље у коме су описане методе дефинисања наменског квалитета масти и производа.

Уџбеник Наменске масти за кондиторску и пекарску индустрију није намењен само студентима Технолошког факултета Нови Сад и студентима Технолошког факултета Зворник, већ свима који се баве производњом, контролом квалитета или развојем нових кондиторских и пекарских производа, било у великим системима или мањим произвођачким јединицама.

**Б-2 Torbica, A., Proračuni u tehnologiji konditorskih proizvoda, Tehnološki fakultet, Zvornik, Univerzitet u Istočnom Sarajevu, 2020, 68 str., ISBN 978-99955-81-34-3.**

#### Кратак приказ књиге

Помоћни уџбеник "Прорачуни у технологији кондиторских производа" намењен је студентима Технолошког факултета Зворник са циљем да им практичним примерима олакша разумевање градива из предмета Технологија кондиторских производа, као и да им приближи врсте проблема са којима се технолози сусрећу у свакодневном раду, како у великим системима, тако и у мањим производним јединицама. Карактеризација супстанци које се користе у кондиторској индустрији заснива се на две претпоставке: (1) Супстанце су делом колоидне, а делом ћелијске природе; (2) Са технолошког становишта, њихова својства су у основи одређена хидрофилном или хидрофобном природом њихових састојака. Ове супстанце су сложени колоидни системи, то су органске материје углавном природног порекла које се састоје од различитих једноставних колоидних система са хијерархијском или квазихијерархијском структуром.

#### **IV Поглавље у међународној књизи**

**Б-3 Zarić, D., Lončarević, I, Pajin, B., Petrović, J., Torbica, A.:** Chapter title: **Production of Chocolate with Soy Milk in a Ball Mill**, Book title: **Chocolate: Production, Consumption and Health Benefits**, Editor: Emily Baker, Nova Science Publishers Inc, Hauppauge NY 11788-3619, United States of America, **2016** (ISBN 978-1-53610-433-2). (R21)

#### Кратак приказ књиге

Today, food not only needs to satisfy hunger and provide the necessary nutrients for the body, but also to prevent the occurrence of diseases that are related to nutrition and improve the physical and mental health of consumers. Functional foods can improve the general condition of the body, reduce the risk of some diseases and furthermore be used to treat some diseases. Given the growing popularity of functional foods and frequent consumption of confectionery products, especially chocolate, the goal of this chapter was to create innovative, functional chocolate - chocolate with soy milk. Chocolate with soy milk is composed of 8-10% soy proteins, which have a positive impact on human health. Soy milk contains more protein and less fat than cow's milk. It is characterized by the absence of cholesterol and lactose, has a low content of saturated fatty



acids, while the content of polyunsaturated fatty acids is significantly higher than in cow's milk. This chocolate is not only interesting because of its health effects, but also because of its textural properties.

The greatest impact on the thermoreological, thermal and textural properties of chocolate have the composition of the ingredients, fat content, selection of emulsifiers, solid particle size distribution and particle packing method. In milk chocolate the ratio of milk fat and cocoa butter determines the quality of chocolate and today everything about it is well known, while the ratio of soy milk - cocoa butter has not been completely defined.

For this chapter, chocolate was produced in an unconventional way, i.e., in a ball mill applying variable refining time (30, 60 and 90 minutes) and pre-crystallization temperature of chocolate mass (26, 28 and

30°C). The chocolate was produced with 20% of soy milk powder. The quality of chocolate was monitored by

investigating nutritive composition, polyphenol content, hardness of chocolate, solid triglyceride content (SFC), thermal characteristics, rheological parameters (Casson yield flow (Pa), Casson viscosity (Pas), the thixotropic loop area, elastic modulus and creep curves) as well as sensory properties. Results showed that chocolate with soy milk had a higher nutritional value and better antioxidant properties than chocolate with powdered milk. The proteins of the soy milk, which are capable of forming a gel if the protein concentration is greater than 8%, lead to the viscoelastic behavior of the chocolate mass. Rheology of the chocolate mass with soy milk depends solely on the soy proteins, while thermal and sensory properties and content of solid triglycerides depends on the fatty phase, i.e., soybean oil. In order to maintain optimal sensory quality, hardness as well as melting resistance of chocolate, it is necessary for the chocolate with soy milk to be refined longer in a ball mill, however also to use lower temperatures for pre-crystallization.

**Б-4 Lončarević, I., Pajin, B., Torbica, A., Šaponjac, V.T., Petrović, J., Zarić, D.:** Chapter title: **Analyzing the Dependence between Cocoa Solids in Chocolate and the Content of Polyphenols, Minerals and Dietary Fiber**, Book title: **The Diversified Benefits of Cocoa and Chocolate**, Editor: Bonifacia Zayas Espinal, Nova Science Publishers Inc, Hauppauge NY 11788-3619, United States of America, **2018** (ISBN 978-1-53613-258-8). (R21)

#### Кратак приказ књиге

The raw materials used for chocolate production provide a source of proteins, carbohydrates, fats, minerals, and vitamins, which are essential for growth and development. Dark chocolate is also rich in polyphenolic compounds, originating from dark solids of cocoa beans. Milk chocolate contains less cocoa bean solids and thus less polyphenolic compounds comparing to dark chocolate. On the other hand, white chocolate contains only cocoa butter and thus lack bioactive components that have a positive impact on human health. Cocoa bean contains several minerals, some of which are found in high amounts in processed chocolate. The amount of retained minerals depends on the content of cocoa bean solids in chocolate. Accordingly, dark chocolate typically has a higher amount of minerals than milk or white chocolate. It is also known that unprocessed cocoa bean presents a good source of dietary fiber, mostly insoluble fiber, which is significantly reduced when removing the cocoa husk. Dark chocolate does not contribute significantly to dietary fiber intake, but, however contains a higher amount of dietary fiber compared to milk chocolate.

This research examined and compared the content of total polyphenols, minerals (potassium, calcium, magnesium, iron, zinc, copper, manganese), total dietary fiber and soluble dietary fiber in indifferent chocolate products collected from the market: white chocolate (25% of cocoa solids – cocoa butter), milk chocolate (25% of cocoa solids), baking chocolate containing 44% of cocoa solids, and dark chocolates containing 58%, 75%, 88%, and 100% of cocoa solids.

#### **У Признати патенти**

1. **Торбица, А., Хаднађев, М., Сакач, М., Седеј, И., Мандић, А., Песторић, М., Мишан, А. (2015) Безглутенски тврди кекс на бази пиринча и хељде намењен индустријској производњи/Gluten-free rice and buckwheat biscuits for industrial use.** Патент је уписан у Регистар патената Завода за интелектуалну

својину Републике Србије под бројем 53724.

2. **Torbica A., Tomić, J., Janić Najnal, E. (2020). Безглутенско чајно пециво на бази екструдираниог просеног брашна са додатком просеног брашна, са повећаним садржајем природних влакана/Gluten-free cookies based on extruded millet flour with addition of untreated millet flour with increased natural fiber content.** Патент је уписан у Регистар патената Завода за интелектуалну својину Републике Србије под бројем 60327;
3. **Торбица А., Томић, Ј., Јанић Хајнал, Е. (2020). Поступак производње хлеба од термички и хидротермички третираних брашна проса, сирка, ражи и овса, без додатка адитива и са повећаним садржајем природних влакана /Production process of bread from hydrothermal and heat treated millet, sorghum, rye and oat flours, without additives, enriched with natural fiber.** Патент је уписан у Регистар патената Завода за интелектуалну својину Републике Србије под бројем 60328.
4. **Торбица, А., Томић, Ј., Пајин, Б., Петровић, Ј., Лончаревић, И. (2020). Безглутенски тврди кекс на бази проса/Gluten-free cookies based on millet.** Патент је уписан у Регистар патената Завода за интелектуалну својину Републике Србије под бројем 60331;
5. **Торбица А., Томић, Ј., Јанић Хајнал, Е., Пајин, Б., Петровић, Ј., Лончаревић, И. (2020). Безглутенски тврди кекс на бази проса са додатком какао праха/Gluten-free cookies based on millet with addition of cocoa powder.** Патент је уписан у Регистар патената Завода за интелектуалну својину Републике Србије под бројем 60332.

#### 4. ОБРАЗОВНА ДЈЕЛАТНОСТ КАНДИДАТА

##### Образовна дјелатност прије посљедњег избора

Свој педагошки рад кандидат Александра Торбица започиње школске 2009/2010. године као доцент на предмету Технологија кондиторских производа.

У звање ванредног професора изабрана је 2015. године и изводи наставу на предметима Технологија кондиторских производа (Први циклус студија) и Нове технологије у производњи кондиторских и сродних производа (Други и трећи циклус студија). Током анкетирања студената које је провођено у датом периоду др Александра Торбица је добила веома високе оцјене за свој стручни и педагошки приступ.

##### Образовна дјелатност после посљедњег избора

Навести све активности (уџбеници и друге образовне публикације, предмети на којима је кандидат ангажован, гостујућа настава, резултате анкете<sup>6</sup>, менторство<sup>7</sup>)

Према увиду у конкурсну документацију констатовано је следеће:

Након избора у звање ванредног професора 2015. године, (ужа научна област Храна и

<sup>6</sup> Као доказ о резултатима студентске анкете кандидат прилаже сопствене оцјене штампане из базе.

<sup>7</sup> Уколико постоје менторства (магистарски/мастер рад или докторска дисертација) навести име и презиме кандидата, факултет, ужу научну област рада.

пиће), изводи наставу на сљедећим предметима: Технологија кондиторских производа (I циклус студија) и Нове технологије у производњи кондиторских и сродних производа (II циклус студија).

У овом периоду др Александра Торбица је објавила је две књиге (два универзитетска уџбеника):

**Б-1** Pajin, B., Torbica, A., Namenske masti za konditorsku i pekarsku industriju, Tehnološki fakultet Novi Sad, Univerzitet u Novom Sadu, 2020, 206 str., ISBN 978-86-6253-070-7.

**Б-2** Torbica, A., Proračuni u tehnologiji konditorskih proizvoda, Tehnološki fakultet, Zvornik, Univerzitet u Istočnom Sarajevu, 2020, 68 str., ISBN 978-99955-81-34-3.

Такође, Кандидат је објавила и два поглавља у међународним књигама:

**Б-3** Zarić, D., Lončarević, I, Pajin, B., Petrović, J., Torbica, A.: Chapter title: **Production of Chocolate with Soy Milk in a Ball Mill**, Book title: **Chocolate: Production, Consumption and Health Benefits**, Editor: Emily Baker, Nova Science Publishers Inc, Hauppauge NY 11788-3619, United States of America, 2016 (ISBN 978-1-53610-433-2). (R21)

**Б-4** Lončarević, I., Pajin, B., Torbica, A., Šaponjac, V.T., Petrović, J., Zarić, D.: Chapter title: **Analyzing the Dependence between Cocoa Solids in Chocolate and the Content of Polyphenols, Minerals and Dietary Fiber**, Book title: **The Diversified Benefits of Cocoa and Chocolate**, Editor: Bonifacia Zayas Espinal, Nova Science Publishers Inc, Hauppauge NY 11788-3619, United States of America, 2018 (ISBN 978-1-53613-258-8). (R21)

Др Александра Торбица је након посљедњег избора била ментор за одбрану докторске дисертације:

**1. Кандидат:** Јелена Томић, дипл. инж.-мастер

Организациона јединица: Технолошки факултет Нови Сад, Универзитет у Новом Саду

Датум одбране: 12.12.2016.

Тема: « Карактеризација албумина и биохемијски аспекти квалитета пшенице (*Triticum aestivum*)»

<https://nardus.mpn.gov.rs/handle/123456789/4771?locale-attribute=en>

Др Александра Торбица је након посљедњег избора био члан комисије за одбрану докторске дисертације:

**2. Кандидат:** Елизабет Јанић Хајнал

Организациона јединица: Технолошки факултет Нови Сад, Универзитет у Новом Саду

Датум одбране: 12.03.2015.

Тема: «Могућности редукације садржаја *Alternaria* токсина у пшеници применом одабраних технолошких поступака»

**3. Кандидат:** Дајана Хрњез, дипл. инж.-мастер

Организациона јединица: Технолошки факултет Нови Сад, Универзитет у Новом Саду

Датум одбране: 26.09.2015.

Тема: «Биолошка активност ферментисаних млечних напитака добијених применом комбухе и конвенционалних стартер култура»

4. **Кандидат:** Јасмина Губић

Организациона јединица: Технолошки факултет Нови Сад, Универзитет у Новом Саду

Датум одбране: 28.03.2016.

Тема: «Профил протеина и састав масних киселина млека магарике балканске расе током периода лактације»

5. **Кандидат:** Милана Драшковић

Организациона јединица: Факултет за биофарминг, Бачка Топола, Универзитет „Дон Незбит“, Београд

Датум одбране: 26.09.2016.

Тема: «Утицај климатских услова на различите особине квалитета зрна генотипова дурум пшенице (*Triticum durum* Desf.)»

6. **Кандидат:** Даница Савановић

Организациона јединица: Технолошки факултет у Зворнику, Универзитет Источно Сарајево

Датум одбране: 10.03.2017.

Тема: «Утицај услова смрзавања на промијену и понашање протеина у прехрамбеним производима»

7. **Кандидат:** Андреј Шекуларац

Организациона јединица: Пољопривредни факултет у Лешку, Универзитета у Приштини са привременим седиштем у Косовској Митровици

Датум одбране: 04.09.2018.

Тема: «Варирање особина технолошког квалитета сорти пшенице (*Triticum aestivum* L.)»

Др Александра Торбица је након последњег избора била интерни ментор за израду докторске дисертације у Научном институту за прехрамбене технологије у Новом Саду, Универзитета у Новом Саду:

1. **Кандидат:** др Јелена Томић
2. **Кандидат:** др Слађана Ракита
3. **Кандидат:** Јудит Беретка, мастер технологије

Такође, др Александра Торбица има и чланство у комисијама за оцјену и одбрану дипломских завршних радова:

**Менторство:**

Александар Осатовић, Сензорна и инструментална карактеризација пуњења за производе од лиснатих теста, Универзитет у Источном Сарајеву, Технолошки факултет Зворник, 23.12.2015.

**Члан комисије:**

Мелиса Рамић, Утицај класификације зрна пшенице по величини на минерални и протеински састав пасажних брашна, Универзитет у Источном Сарајеву, Технолошки факултет Зворник

Бранкица Божић, Могућност управљања пецивним својствима брашна примјеном

класификације зрна пшенице по величини, Универзитет у Источном Сарајеву, Технолошки факултет Зворник, 18.03.2016.

Др Александра Торбица је рецензирала више десетина научних радова у мађународним часописима (61 верификована рецензија у бази Publons), као и више десетина стручних и научних радова објављених и националним часописима и националним и међународним конференцијама.

Чланови Комисије су након увида у извјештаје Технолошког факултета, установили да резултати указују на највишу оцјену коју је др Александра Торбица добијала током провођења вишегодишњих студентских анкета (Просјечна оцјена у студентским анкетама из 2017/18 и 2018/19 академске године је била 5).

#### **Посјете високошколским установама, академије, симпозијуми, конференције у иностранству, након посљедњег избора:**

- 2016: Студијска посјета Универзитету у Генту: Oleogelation in food products.
- March 2017: Institute of Food Technology (Serbia) and Leiden University (Netherlands), Workshop in Novi Sad, Serbia: "Green extraction techniques in food science".
- 22-23. мај, 2017: Креирање успешног бизнис плана, UNIBO – Универзитет у Болоњи, Италија, ФИНС, Нови Сад (Србија)
- 11-12. децембар, 2017: Заштита интелектуалне својине у науци о храни, Ирски развојни центар у области хране и пољопривреде (Teagasc Agriculture and Food Development Authority), Ирска, ФИНС, Нови Сад (Србија)
- December 2018: Fund for European Affairs of the Autonomous Province of Vojvodina, Seminar in Novi Sad, Serbia: "The possibilities of financing through EU funds".

#### **5. СТРУЧНА ДЈЕЛАТНОСТ КАНДИДАТА**

Навести учешће у НИ пројектима (одобрени и завршени: назив НИ пројекта са ознаком, период реализације, да ли је кандидат руководилац или учесник).

#### **Стручна дјелатност прије посљедњег избора (П-пројекат)**

##### Координатор пројекта:

**П-1. ТР 31007, 2011-2014.** године, Министарства за науку и технолошки развој Републике Србије, **Вредновање квалитета и оптимизација прераде пшенице у светлу климатских промена**

**П-2. 2012-2013: пројекат билатералне сарадње са Француском „Примена модификованих скрובהа у производњи хлеба: мултидисциплинарна испитивања структуре хлеба током производње и утицај на квалитет крајњег производа”** (број пројекта 680-00-132/2012-09/17) године, Министарства за науку и технолошки развој Републике Србије

##### Сарадник у пројекту:

**П-1. ТР-20068, 2008-2011.** године, Министарства за науку и технолошки развој

Републике Србије, **Прехрамбени производи за групе потрошача са специјалним захтевима и потребама**, руководилац: др Маријана Сакач

**П-2. ТР-20139, 2008-2011.** године, Министарства за науку и технолошки развој Републике Србије, **Унапређење квалитета стрних жита**, руководилац: др Никола Христов

**П-3. ИИИ46001, 2011-2014.** године, Министарства за науку и технолошки развој Републике Србије, **Развој и примена нових и традиционалних технологија у производњи конкурентних прехранбених производа са додатом вредношћу за европско и светско тржиште - СТВОРИМО БОГАТСТВО ИЗ БОГАТСТВА СРБИЈЕ**, руководилац: др Јасна Мاستиловић.

**П-4. 2009-2011:** компонента Agricultural Promotion програм у оквиру Integrated Regional Development Plan of АП Војводина, финасиран од стране Austrian Development Agency

**П-5. 2010-2011: Development of warehouse receipt system in Serbia**, local project coordinator др Јасна Мاستиловић, funded by FAO/EBRD

**П-6. 2011-2012.** пројекат билатералне сарадње са Хрватском, Министарства за науку и технолошки развој Републике Србије, **Генетска разноликост протеина глутена и њихова повезаност с пекарским квалитетом пшенице (*Triticum aestivum* L.)**, носилац: др Невена Ђукић

**П-7. 2011-2014:** FP7-KBBE-2010-4 Proposal No 266331 **Low cost technologies and traditional ingredients for the production of affordable, nutritionally correct, convenient foos enhancing health in population groups at risk of poverty CHANCE**, contracted with EC

### Стручна дјелатност послје последњег избора

#### Координатор пројекта:

**П-1. ТР 31007, 2011-2019.** године, Министарства за науку и технолошки развој Републике Србије, **„Вредновање квалитета и оптимизација прераде пшенице у светлу климатских промена“**

**П-2. 2015-2016, Технолошки потенцијал мање заступљених ратарских култура Војводине**, краткорочни пројекат од посебног интереса за одрживи развој у АП Војводини у 2016. години Покрајинског секретаријата за науку и технолошки развој

#### Сарадник у пројекту:

**П-1. ИИИ46001, 2011-2019.** године, Министарства за науку и технолошки развој Републике Србије, **Развој и примена нових и традиционалних технологија у производњи конкурентних прехранбених производа са додатом вредношћу за европско и светско тржиште - СТВОРИМО БОГАТСТВО ИЗ БОГАТСТВА СРБИЈЕ**, руководилац: др Јасна Мастиловић.

**П-2.** 2016-2020, **Валоризација споредних производа прехрамбене индустрије кроз развој нутритивно обогаћених финих пекарских производа (114-451-2085/2016)**, пројекат од значаја за науку и технолошки развој АП Војводине за пројектни циклус 2016-2019. године Покрајинског секретаријата за високо образовање и научноистраживачку делатност

**П-3.** 2017-2018, **Еколошки дизајн функционалног паковања на основу био-полимера (полилактида) и био-активних природних једињења**, (142-451-2771/2017-01/02) краткорочни пројекат од посебног интереса за одрживи развој у АП Војводини у 2017. години Покрајинског секретаријата за високо образовање и научноистраживачку делатност

**П-4.** 2018-2019, **Proteini kao alternativa aditivima u kreiranju hleba od prosa-potencijalne strateške kulture na teritoriji Vojvodine**, (142-451-2820/2018-01) краткорочни пројекат од посебног интереса за одрживи развој у АП Војводини у 2018. години Покрајинског секретаријата за високо образовање и научноистраживачку делатност

**П-5.** 2018 – 2019: Bilateralni projekat Srbija – Slovenija za ciklus 2018 – 2019, BI-18/19-007: **"Novi zakonom neregulisani mikotoksini u žitima: procena rizika i ispitivanje mogućnosti smanjenja postupkom ekstrudiranja"**, **"New non-regulated mycotoxins in cereals: risk assessment and possibility of reduction by extrusion processing"**, у оквиру научна и технолошке сарадње између Републике Србије и Републике Словеније

**П-6.** 2019-2020, **"Collaborative study of acrylamide occurrence and qualitative aspects of Triticale-based confectionery products"**, Serbian-Slovak joint research project GA No. 337-00-107/2019-09/02, funded by the Ministry of Education, Science and Technological Development of the Republic of Serbia and Slovak Research and Development Agency.

**П-7.** 2020-2021, **Локална жита у функцији развоја гастро-туристичке понуде Војводине**, краткорочни пројекат од посебног интереса за одрживи развој у АП Војводини у 2018. години Покрајинског секретаријата за високо образовање и научноистраживачку делатност

**П-8.** 2019-2021, **Утицај додатка биљног екстракта на својства природног омотача и одрживост Домаће ферментисане кобасице**, Национални научноистраживачки пројекат број 1251109, Министарство науке и технологије Републике Српске, руководиоцац: проф. др Сњежана Мандић

**П-9.** 2019-2021, **Промјене протеина у току смрзавања прехрамбених производа**, Национални научноистраживачки пројекат број 1251107, Министарство науке и технологије Републике Српске, Технолошки факултет Универзитета у Бањој Луци, руководиоцац: доц. др Даница Савановић

**П-10.** 2020-2022, **Испитивање квалитета сирева добијених различитим поступцима топлотно-киселинске коагулације млијека**, Национални научноистраживачки пројекат број 1251138, Министарство науке и технологије Републике Српске, Технолошки факултет Универзитета у Бањој Луци, руководиоцац:

доц. др Даница Савановић

### **Остале стручне дјелатности:**

#### **Уредништво часописа:**

Члан уређивачког одбора научног часописа “Food and Feed Research”, издавач: Научни институт за прехранбене технологије, Нови Сад, Србија

#### **Цитираност (Google Scholar):**

- Укупан број навода: 1722 (1320 од 2015. године)
- h-Индекс: 18 (17 од 2015. године)
- i10-Индекс: 38 (33 од 2015. године)

#### **Функције које је кандидат обављао или обавља након посљедњег избора:**

- Руководилац Истраживачке јединице за храну и технологију хране у оквиру Истраживачког Центра за технологију биљних прехранбених производа Научног института за прехранбене технологије у Новом Саду, Универзитета у Новом Саду, од јануара 2011. до септембра 2020. године.
- Помоћник директора за науку, Научног института за прехранбене технологије у Новом Саду, Универзитета у Новом Саду, од јула 2019. године до данас.

#### **Награде и признања**

Кандидат је први аутор и коаутор најзначајнијих научних постигнућа на Универзитету у Новом Саду испред Научног института за прехранбене технологије за 2016, 2017. и 2019. годину, а који су објављени на интернет страници Универзитета у Новом Саду.

#### **Научни одбори**

Др Александра Торбица је била члан:

- научног комитета International Congress – 3rd International Congress “Food Technology, Quality and Safety” (FoodTech2016), Novi Sad, Serbia
- научног комитета International Congress – 4th International Congress “Food Technology, Quality and Safety” (FoodTech2018), Novi Sad, Serbia

2Други кандидат и сваки наредни ако их има (све поновљено као за првог кандидата).

### **6. РЕЗУЛТАТ ИНТЕРВЈУА СА КАНДИДАТИМА<sup>8</sup>**

Интервју са кандидатом обављен је 22.10.2020.године, у 13:00 часова у просторијама Технолошког факултета Зворник. Интервју је обављен уз присуство проф. др Александра Фиштеша, проф. др Биљане Пајин и проф. др Јованке Попов Раљић. На основу извршеног интервјуа са кандидатом као и његовог досадашњег рада, чланови Комисије са задовољством закључују да кандидат својим компетенцијама испуњава

<sup>8</sup> Интервју са кандидатима за изборе у академска звања обавља се у складу са чланом 4а. Правилника о поступку и условима избора академског особља Универзитета у Источном Сарајеву (Интервју подразумева непосредан усмени разговор који комисија обавља са кандидатима у просторијама факултета/академије. Кандидатима се путем поште доставља позив за интервју у коме се наводи датум, вријеме и мјесто одржавања интервјуа.)



опште и посебне услове предметног конкурса.

**7. ИНФОРМАЦИЈА О ОДРЖАНОМ ПРЕДАВАЊУ ИЗ НАСТАВНОГ ПРЕДМЕТА КОЈИ ПРИПАДА УЖОЈ НАУЧНОЈ/УМЈЕТНИЧКОЈ ОБЛАСТИ ЗА КОЈУ ЈЕ КАНДИДАТ КОНКУРИСАО, У СКЛАДУ СА ЧЛАНОМ 93. ЗАКОНА О ВИСОКОМ ОБРАЗОВАЊУ<sup>9</sup>**

Кандидат др Александра Торбица је у протеклом периоду у звању ванредног професора изводила наставу на предметима Технологија кондиторских производа и Нове технологије у производњи кондиторских и сродних производа на Технолошком факултету Зворник (студијски програм „Хемијско инжењерство и технологија“), те у складу са чланом 93. Закона о високом образовању РС, није било потребе организовати предавање.

**III ЗАКЉУЧНО МИШЉЕЊЕ**

Експлицитно навести у табели у наставку да ли сваки кандидат испуњава услове за избор у звање или их не испуњава.

**Први кандидат**

Минимални услови за избор у звање <sup>10</sup>	испуњава/не испуњава	Навести резултате рада (уколико испуњава)
Има проведен најмање један изборни период у звању ванредног професора	испуњава	Одлука број 01-С-05-XXXVI/15
Има најмање осам научних радова из области за коју се бира, објављених у научним часописима и зборницима са рецензијом, након стицања звања ванредног професора	испуњава	Приложене библиографске јединице
Има најмање двије објављене књиге (научну монографију или универзитетски уџбеник) након стицања звања ванредног професора	испуњава	Књиге приложене у конкурсном материјалу
Има успјешно реализовано менторство кандидата за степен другог или трећег циклуса	испуњава	Документација из доктората достављена у конкурсном материјалу и web link према репозиторијуму докторских дисертација Универзитета у Новом Саду и Извјештају
Има успјешно остварену	испуњава	Уговор достављен у конкурсном

<sup>9</sup> Кандидат за избор у наставно-научно звање, који раније није изводио наставу у високошколским установама, дужан је да пред комисијом коју формира вијеће организационе јединице, одржи предавање из наставног предмета уже научне/умјетничке области за коју је конкурисао.

<sup>10</sup> У зависности у које се звање бира кандидат, навести минимално прописане услове на основу члана 77., 78. и 87. Закона о високом образовању односно на основу члана 37., 38. и 39. Правилника о поступку и условима избора академског особља Универзитета у Источном Сарајеву

међународну сарадњу са другим универзитетима и релевантним институцијама у области високог образовања		материјалу
<b>Додатно остварени резултати рада (осим минимално прописаних)</b>		
Навести преостале публиковане радове, пројекте, менторства, ...		
Наведени у поглављу 3,4 и 5 предметног извјештаја		
<b>Други кандидат и сваки наредни уколико их има (све поновљено као за првог)</b>		
-		
Полазећи од Закона о високом образовању („Службени гласник Републике Српске“ бр. 73/10, 104/11, 84/12, 108/13, 44/15, 90/16, 5/17, 31/18, 26/19 и 40/20), Статута Универзитета у Источном Сарајеву и Правилника о поступку и условима избора академског особља на Универзитету у Источном Сарајеву, којима су прописани услови за избор наставника, а на основу приложеног конкурсног материјала, обављеног интервјуа са кандидатом, броја и квалитета објављених и презентованих радова, наставног искуства, као и укупне научно-истраживачке, образовне и стручне дјелатности кандидата, Комисија са посебним задовољством предлаже Научно-наставном вијећу Технолошког факултета Зворник и Сенату Универзитета у Источном Сарајеву да ванредног професора др Александру Торбицу изабере у академско звање <b>РЕДОВНОГ ПРОФЕСОРА</b> за ужу научну област <b>Храна и пиће</b> .		

### Ч Л А Н О В И К О М И С И Ј Е:

1. **Др Александар Фиштеш, редовни професор, предсједник**  
Ужа научна област: Технологија угљенохидратне хране (Храна и пиће)  
Универзитет у Новом Саду, Технолошки факултет

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2. **Др Биљана Пајин, редовни професор, члан**  
Ужа научна област: Технологија угљенохидратне хране (Храна и пиће)  
Универзитет у Новом Саду, Технолошки факултет

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3. **Др Јованка Попов Раљић, редовни професор у пензији, члан**  
Ужа научна област: Технологија и квалитет хране (Храна и пиће)  
Универзитет у Новом Саду, Природно-математички факултет

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**IV ИЗДВОЈЕНО ЗАКЉУЧНО МИШЉЕЊЕ**

Уколико неко од чланова комисије није сагласан са приједлогом о избору дужан је своје издвојено мишљење доставити у писаном облику који чини сасатвни дио овог извјештаја комисије.

**Ч Л А Н К О М И С И Ј Е:**

1. \_\_\_\_\_

Мјесто: Зворник  
Датум: 23.10.2020.