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International scientific conference of young scientist and students

"Youth scientific achievements to the 21st century nutrition problem solution"

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The publication contains materials of 84 International scientific conference of young scientists and students "Youth scientific achievements to the 21st century Nutrition problem solution".

It was considered the problems of improving existing and creating new energy and resource saving technologies for food production based on modern physical and chemical methods, the use of unconventional raw materials, modern technological and energy saving equipment, improve of efficiency of the enterprises, and also the students research work results for improve quality training of future professionals of the food industry.

The publication is intended for young scientists and researchers who are engaged in definite problems in the food science and industry.

Scientific Council of the National University of Food Technologies recommends the journal for printing. Minutes № 9, 29.03.2018

Матеріали 84 міжнародної наукової конференції молодих учених, аспірантів і студентів "Наукові здобутки молоді – вирішенню проблем харчування людства у XXI столітті", 23–24 квітня 2018 р. – К.: НУХТ, 2018 р. – Ч.2. – 505 с.

Видання містить матеріали 84 Міжнародної наукової конференції молодих учених, аспірантів і студентів.

Розглянуто проблеми удосконалення існуючих та створення нових енерго- та ресурсоощадних технологій для виробництва харчових продуктів на основі сучасних фізико-хімічних методів, використання нетрадиційної сировини, новітнього технологічного та енергозберігаючого обладнання, підвищення ефективності діяльності підприємств, а також результати науково-дослідних робіт студентів з метою підвищення якості підготовки майбутніх фахівців харчової промисловості.

Розраховано на молодих науковців і дослідників, які займаються означеними проблемами у харчовій науці та промисловості.

Рекомендовано вченою радою Національного університету харчових технологій. Протокол № 9 від 29 березня 2018 р.

41. Optimization of polyphenolic compound extraction from defatted grape seed cake by conventional and nonconventional methods

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Introduction. The research was carried out to determine the optimal conditions of polyphenolic compounds extraction from defatted grape seed cake to obtain extracts with the maximum antioxidant activity.

Materials and methods. The aqueous and water-alcohol extracts of the cold pressed low-fat grape seed cake obtained by convective and non-convective extraction methods were used as the object of the study. The total antioxidant capacity was determined by galvanostatic coulometry [1], the total content of polyphenol, flavonoids and proanthocyanidins was determined spectrophotometrically by Folin-Ciocalteu, aluminum chloride colorimetric and acid butanol assays [2], respectively. The total antioxidant activity (TAA) was assessed with the DPPH array.

Results and discussion. Plant objects are considered to be promising sources of antioxidants. Therefore, the development of technologies for the production of additives in the form of liquid extracts and powders from vegetable raw materials is a topical direction in the creation of Foods for Specific Health Use. The aim of the work was to optimize the conditions for obtaining aqueous and water-alcohol extracts from defatted grape seed cake powder (Oleovita™, Orion, Ukraine) using the conventional method of obtaining phenolic-rich extracts by solid-liquid extraction and methods such as ultrasound and microwaves. Extraction was carried out using distilled water and 96% ethyl alcohol. A response surface methodology with central composition design was applied to investigate of experimental data. The experimental design, surface and contour plots and response surface regression followed by analysis of variance (ANOVA) to assess full correspondence and significance of regression coefficients were performed using Design-Expert software. The influence of the three parameters, including extraction temperature and time, liquid-to-solid (L/S) ratio were studied by a single experimental scheme to determinate the proper range for each independent variable of aqueous extracts. For water-alcohol extracts, a fourth factor was added, related to the ratio of water and alcohol content in the mixture. In conventional methods, instead of the temperature factor, the power of ultrasound or microwave. The obtained results indicate that the selected factors have the influence on the extraction polyphenolic substances. So for water extracts the following optimum conditions were obtained: the temperature is equal 373 K, the time is equal 147 and the ratio is 80. For water-alcohol extracts, a maximum is observed in a water-alcohol mixture with a ratio of 1:1 at a temperature of 333 K and the L/S ratio in the range 10-25 depending on the property. Similar data are also discussed for nonconventional methods.

Conclusions. The resulting aqueous and hydro-alcoholic extracts can be used as antioxidant additives in innovative technologies of Food for Specific Health Use.

References

1. Gubsky S., Artamonova M., Shmatchenko N., Piliugina I., Aksenova E. (2016), Determination of total antioxidant capacity in marmalade and marshmallow, *Eastern-European Journal Enterprise Technologies*, 4, 11(82), pp. 43–51.
2. Shahid F., Naczk M. (2004), *Phenolics in Food and Nutraceuticals*, CRC Press, Boca Raton.

Наукове видання

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