MONOGRAFIA
POKONFERENCYJNA

SCIENCE,
RESEARCH, DEVELOPMENT #16

TECHNICS AND TECHNOLOGY.

Barcelona

29.04.2019- 30.04.2019

U.D.C. 330+339.138+658+657+336.71+339+082
B.B.C. 94
Z 40

Zbiór artykułów naukowych recenzowanych.
(1) Z 40 Zbiór artykułów naukowych z Konferencji Miedzynarodowej Naukowo-Praktycznej (on-line) zorganizowanej dla pracowników naukowych uczelni, jednostek naukowo-badawczych oraz badawczych z państw obszaru byłego Związku Radzieckiego oraz byłej Jugosławii.

(*30.04.2019*) - Warszawa, 2019. - 88 str.
ISBN: 978-83-66030-96-1

Wydawca: Sp. z o.o. «Diamond trading tour»
Adres wydawcy i redakcji: 00-728 Warszawa, ul. S. Kierbedzia, 4 lok.103
e-mail: info@conferenc.pl

W artykułach naukowych zachowano oryginalną pisownię.

Wszystkie artykuły naukowe są recenzowane przez dwóch członków Komitetu Naukowego.

W przypadku cytowań obowiązkowe jest odniesienie się do monografii.

Nakład: 80 egz.

ISBN: 978-83-66030-96-1

SOME FEATURES OF OATS PROCESSING

Sots S.
c. tech. sc. (ph.D.), docent,
Odessa national academy of food technologies

Kustov I.
c. tech. sc. (ph.D.), senior lecturer,
Odessa national academy of food technologies

Key words: oats, naked oats, groats, flakes, chemical composition.

Groats and cereal products, along with bread, are traditional food products and represent a significant part of the human consumption. Due to balanced amino acid composition, presence of vitamins and minerals, dietary fiber most types of groats can be classified as dietary products. In the modern structure of nutrition human cereal products take about 20...30 % of the total consumption of grain products.

The peculiarity of the groats production is the presence of a wide range of raw materials. In cereal plants traditionally processing eight major cereal crops: rice, millet, buckwheat, oats, barley, corn, wheat and legumes – peas, and well as small quantities of sorghum, lentils and chickpeas.

In Ukraine over the past decade products of oats processing become traditional for the majority of population. Oats crop among other cereals characterized by the most valuable chemical composition – high content of protein, fat, digestible carbohydrates, vitamins, minerals etc. In oats grain are present all essential for human body amino acids which indicates the high biological value of products derived from it. Oats grain and its products contain a high mass fraction of fat (5.0…7.0 %) while the mass fraction of important for the human body polyunsaturated fatty acids is 70-80 %, which suggests a high biological effectiveness of oat grains. Among the carbohydrate complex, except starch and other substances great value has non starch polysaccharide β-glucan. This substance refers to the soluble fibers which have the ability to regulate degree of cholesterol and sugar in blood and affect to regulation of weight, etc., so is a necessary ingredient in the human diet. According to various sources oatmeal among other cereals and cereal products on the content of dietary fiber holds one of the leading positions having them mass fraction of 7-8 %.

Processing oats grain by existing traditional technologies through the use of complex and extended of technological process does not allow using all potential inherent to oats crop. Standard products of processing oats in Ukraine are not crushed oats groat of which during further processing produces flaked groats, flakes "Hercules", "Pelyustkovi". Separate oat products are flakes "Extra" and "Tolo-

kno" (special prepared oats flour). Not crushed oats groats are products derived from whole kernel they are divided into grades by quantitative content of benign and crushed kernel and presence in the product not hulled grain. Flaked groats and all kinds of oats flakes through the passage during their producing additional special treatment can be referred to the instant foods.

Numbers of flakes "Extra" proportional to the size and shape of previously prepared raw materials due to what they have a high uniformity which is provided by passage and overtail of defined number of sieve. "Tolokno" by its properties are very important food product. As stand-alone product "Tolokno" widely used in dietary nutrition. "Tolokno" and different kinds of oat flour due to the absence of gluten as separate products is almost not applicable but in mixtures with wheat flour oats flour widely used in the baking industry in the production of bread bakery and confectionery products and as in improver in other areas of food processing industry.

The existing technologies do not allow getting a high yield of finished products by processing of oats, which does not exceed 55-65 % even when using the most modern hull oat varieties with improved properties. Also there is need for warehousing, storage and utilization a significant amount of husk the amount of which, depending on the varietal characteristics of processed grain, can reach 20-40 % .

The technological processes of processing hulled oats are amongst the most difficult in cereal production include water heat treatment by method of hot conditioning, hulling in several systems, sorting of hulling products, complex groats separation stage, pearling etc, all this leads to significant energy costs of technology and the need for large production areas for its implementation.

At different stages of processing, especially at the steaming stage decreases the nutritional value of grain and accordingly products of its processing observed decrease in the mass fraction of protein, starch, vitamins etc. By dehulling and pearling of grain formed significant amount of by-products as husking bran and particles of crushed kernels (15-35 %) which are formed by external and internal parts of the oat kernel and reduce the mass fraction of protein, β-glucans, vitamins, minerals etc., in aggregate with low values of a finished products allows to speak about low efficiency of existing technologies for production modern oriented food.

References

1. Kroshko, GD (1998). Rules for organizing and maintaining the technological process at the mill factories. K .: WIPOL.
2. Kaukovirta-Norja, A., Wilhelmson, A., & Poutanen, K. (2004). Germination: a means to improve the functionality of oat.
3. Gambuś, H., Gibiński, M., Pastuszka, D., Mickowska, B., Ziobro, R., & Witkowicz, R. (2011). The application of residual oats flour in bread production in order to improve its quality and biological value of protein. Acta Scientiarum Polonorum Technologia Alimentaria, 10(3), 317-325.
4. Marshall, A., Cowan, S., Edwards, S., Griffiths, I., Howarth, C., Langdon, T., & White, E. (2013). Crops that feed the world 9. Oats-a cereal crop for human and

livestock feed with industrial applications. Food Security, 5(1), 13-33.
5. Eliasson, A. C. (2006). Carbohydrates in food. CRC press.
6. Chu, Y. (Ed.). (2013). Oats nutrition and technology. John Wiley & Sons.
7. Hamaker, B. R. (Ed.). (2007). Technology of functional cereal products. Elsevier.
8. Sots, S.M. Evaluation of some technological factors of Ukrainian naked oats and barley affecting on its processing to food products - http://pscipub.com/Journals/Data/JList/Scientia%20Agriculturae/2014/Volume%208/Issue%201/8.pdf
9. Peltonen-Sainio, P., Kirkkari, A. M., & Jauhiainen, L. (2004). Characterising strengths, weaknesses, opportunities and threats in producing naked oat as a novel crop for northern growing conditions.
10. Henry, R., & Kettlewell, P. (Eds.). (2012). Cereal grain quality. Springer Science & Business Media.
11. Conciatori, A., Stefanis, E. D., Redaelli, R., & Sgrulletta, D. (2000). Chemical characterization of some kernel traits in naked oat genotypes. Journal of Genetics & Breeding, 54(4), 299-302.
12. Welch, R. W. (Ed.). (2012). The oat crop: production and utilization. Springer Science & Business Media.