



New Modern Innovative Technologies in Storage of Grain Products

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ABSTRACT

With the use of innovations in grain processing enterprises, the goal of increasing production efficiency, obtaining new opportunities to improve product quality and customer satisfaction is achieved. The main place in the creation of innovative technologies is occupied by a scientific idea, then research is conducted to confirm the scientific concept and testing in industrial conditions. All this will allow to effectively integrate new technologies into production processes at enterprises. As part of this direction, the scientific idea of creating products enriched with trace elements has found its embodiment in a new way of enriching grain products with trace elements

Keywords:

grain products, processing, technology, method, innovation, efficiency.

Introduction

"Repeatedly conducted various studies have shown that the majority of the population in Uzbekistan revealed violations of proper nutrition, due to both insufficient consumption of food substances and their irrational ratio". Therefore, "cereals and products of their processing are an integral attribute of a full-fledged nutrition" [2, 3].

Currently, trends in the nutrition of the Uzbekistan population are aimed at improving the health of the body, eating foods with functional properties. "This market offers products that meet the physiological need for nutrition". Therefore, one of the main directions in development of the grain processing industry is the intensification of technological processes, including the impact on raw materials by various methods, leading to changes in the physical and chemical properties of plant raw materials [5, 6].

Materials And Methods

Therefore, in the grain processing industry, considerable attention is paid to the

introduction of advanced methods and the most advanced equipment in order to increase the efficiency of grain use in its processing. "The method can be considered universal in the framework of both the processing industry and the agro industrial complex as a whole" [4].

The introduction of new innovative technologies for processing grain products makes it possible to increase the period of the product presence on the market due to the appearance of new quality characteristics of the product [2].

The use of innovative technologies in the production of products from grain raw materials is studied by both Russian and foreign scientists. P. D. Polandova, S. D. Shestakov, T. P. Volokhova, V. N. Khmelev, T. V. Shlenskaya, O. N. Krasulya, B. A. Krasulya, V. I. Bogush, Ya. A. Artemova, L. Wangl worked on the problem of introducing innovative technologies into the food industry. Such authors as Zakshevsky V. G. and Bogomolov A.V. in their work [4] consider "the use of new ingredients (of plant origin) in the technology of grain processing in order to improve the quality of flour and bread. The main

goal of implementing an innovative solution is to correct the shortcomings of the raw material (grain) and give the final product the desired consumer properties (increased nutritional and biological value)".

Results And Discussion

In innovative technologies, changes in processing facilities, processes, and organization methods can be radical or gradual, and both ways of change are acceptable for grain processing. With the use of innovations in grain processing enterprises, the goal of increasing production efficiency, obtaining new opportunities to improve product quality and customer satisfaction is achieved [3].

The first place in the creation of innovative technologies is a scientific idea, then research is conducted to confirm the scientific concept and testing in industrial conditions. An important stage of innovation is testing the technology and, considering the results obtained, making final changes to the technological process and creating regulatory and technical documentation. All this will allow to effectively integrate new technologies into the production processes of the enterprise. The most successful innovative technological solutions become typical for the grain processing industry until more advanced technological techniques and technologies appear on the market.

One example in the grain processing industry in the production of flour and cereals is the use of technology that uses ultrasound-treated water to cool the grain, it reduces the preparation of raw materials for processing by almost 3 times. In addition to the acceleration of technological operations, there is also a positive effect on the finished product, for example, bread produced using such flour remains fresh for 72 hours [4, 5, 6].

As part of this direction, the scientific idea of creating products enriched with trace elements was embodied in a new method, for which patent No. 25055078 "Method for enriching cereal products with trace elements" was obtained. The novelty of the technical solutions concepts, the developed method for obtaining products enriched with trace

elements became the basis of innovative technology for the production of enriched textured products with specified functional and technological properties [3].

This technology has been tested in the laboratory, tested at a grain processing plant, and a set of regulatory and technical documentation has been developed for new products. All the activities carried out allow to attribute the development of technology for the production of microelement-rich textured products to innovative ones.

The SanPiN 2.3.2.1078-01 [4] defines vitamins and mineral salts that are allowed for use in the production of specialized products. These include ferrum sulfate, from which working solutions were prepared for the enrichment of raw materials with a trace element Fe.

During the experiment, the following operating characteristics were used: temperature - in the range from 25 to 60 ° C, where 25 ° C is the natural temperature. Given that at 67.5 ° C the starch chains are completely gelatinized, the maximum temperature of the experiment is 60 ° C.

Conclusion

The basis of innovative technology for the production of enriched textured products with specified functional and technological properties is the novelty of the technical solutions concepts, the developed method for obtaining products enriched with trace elements. The calculation of the planned calculation of textured products enriched with microelement (Fe) obtained by innovative technology from wheat, barley and oat extrudates per 1 ton showed the efficiency of their production.

The production of the developed assortment of bread with the using textured products is economically feasible. This confirms the calculated level of profitability, which was more than 13 % for all types of bread products. Thus, while maintaining high quality and affordable prices, the developed types of products will be competitive and bring good profits to enterprises.

References

1. L Allen, de Benoist B, Dary O and Hurrell R 2006 World Health Organization Guidelines on Food Fortification with Micronutrients (Geneva) p 376
2. Yanova M A and Gusev A I 2015 Technology of enrichment of cereals with microelements
3. (Krasnoyarsk SAU: Krasnoyarsk) p 120
4. Yanova M A, Gusev A I and Bindyukova A V 2016 Deep enrichment of raw materials for the flour industry Storage and processing of agricultural raw materials **2** 9-11
5. Nezamova O A and Olentsova J A 2020 Monitoring Consumer Behaviour in the Food Market in the Krasnoyarsk Region of Russia International Conference on Efficient Production and Processing (ICEPP-2020), E3S Web of Conferences **161** 01080
6. Bogatyrev A N 1995 System of scientific and engineering support of food and processing industries of the agro-industrial complex of Russia (Moscow: Food industry) p 528
7. Raichstadt L I 1987 Some directions of processing of stale and deformed bread Food and processing industry **8** 40-1