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UDK 664.66
IRSTI 65.09.05
https://doi.org/10.48184/2304-568X-2022-3-156-160

COMPARATIVE ANALYSIS OF THE QUALITY INDICATORS OF BREAD MADE OF COMPOSITE FLOUR USING OZONATED WATER

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According to the First President of Kazakhstan, it is important to exclude any possibility of food shortages. In this regard, the primary task of the population is to create innovative technologies for the successful promotion and avoidance of food shortages. Bread is one of the most important food products in Kazakhstan. Consequently, the main task of the population of the bakery industry today is the creation of innovative technologies for functional food products. The article presents the results of an organoleptic study of the bread of innovative preparation using composite flour and ozonated water. To create a scientific basis in the production of bread "Composon", a study of organoleptic indicators was conducted. The quality of bread was assessed for compliance with the requirements of regulatory documents. The use of ion-ozone technology makes it possible to reduce environmental pollution, increase the nutritional value of bakery products, as well as reduce material and energy resources. As a result of the study, it was found that the use of ionized water with composite flour affects the improvement of organoleptic indicators of product quality: the color is more uniform, the taste and smell are pronounced and fragrant, the shape of the product is rounded, the texture of the crumb with uniform porosity. Wheat bread, which was made from composite flour and using ozonated water according to the studied technology, retains the freshness of the crumb for 48 hours, has a lower possibility of infection with potato disease, and is also characterized by good organoleptic characteristics.

Keywords: bread, composite flour, the nutritional value of bread, product, premium-grade, organoleptic indicators, bread quality.

ОЗОНДАЛҒАН СУДЫ ПАЙДАЛАНА ОТЫРЫП, КОМПОЗИТТІ ҰННАН ЖАСАЛҒАН НАН САПАСЫНЫҢ КӨРСЕТКІШТЕРІН САЛЫСТЫРМАЛЫ ТАЛДАУ

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Қазақстанның Тұңғыш Президентінің айтуынша, азық-түлік тапшылығының кез келген мүмкіндігін болдырмау маңызды. Осыған байланысты халықтың бірінші кезектегі міндеті табысты ілгерілеу және азық-түлік тапшылығын болдырмау үшін инновациялық технологиялар құру болып табылады. Нан – Қазақстандағы ең маңызды азық-түлік өнімдерінің бірі. Демек, бүгінгі таңда нантоқаш өндірісі тұрғындарының негізгі міндеті функционалды мақсаттағы тамақ өнімдерінің инновациялық технологияларын құру болып табылады. Мақалада композитті ұн мен озондалған суды қолдана отырып, инновациялық нан өнімдерін органолептикалық зерттеу нәтижелері келтірілген.

"Композон" нан өндірісінде ғылыми негіздерді құру үшін органолептикалық көрсеткіштерге зерттеу жүргізілді. Нанның сапасын бағалау нормативтік құжаттардың талаптарына сәйкес жүргізілді. Ион-озон технологиясын қолдану қоршаған ортаның ластануын азайтуға, нан-тоқаш өнімдерінің тағамдық құндылығын арттыруға, сондай-ақ материалдық және энергетикалық ресурстарды азайтуға мүмкіндік береді. Зерттеу нәтижесінде композициялық ұнмен иондалған суды пайдалану өнім сапасының органолептикалық көрсеткіштерінің жақсаруына әсер ететіні анықталды: түсі біркелкі, дәмі мен иісі айқын және хош иісті, өнімнің пішіні дөңгелек, біркелкі кеуектілігі бар үгінділердің құрылымы. Композициялық ұннан жасалған және зерттелген технология бойынша озондалған суды қолданатын бидай наны 48 сағат бойы балғындықты сақтайды, картоп ауруын жұқтыру мүмкіндігі төмен, сонымен қатар жақсы органолептикалық көрсеткіштермен сипатталады.

Негізгі сөздер: нан, композициялық ұн, нанның тағамдық құндылығы, өнім, жоғары сорт, органолептикалық көрсеткіштер, нанның сапасы.

СРАВНИТЕЛЬНЫЙ АНАЛИЗ ПОКАЗАТЕЛЕЙ КАЧЕСТВА ХЛЕБА ИЗ КОМПОЗИТНОЙ МУКИ С ИСПОЛЬЗОВАНИЕМ ОЗОНИРОВАННОЙ ВОДЫ

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По словам Первого Президента Казахстана важно исключить любую возможность дефицита продовольствия. В связи с этим, первостепенной задачей населения является создание инновационных технологий для успешного продвижения и избежания дефицита продовольствия. Хлеб – один из важнейших продуктов питания в Казахстане. В данной работе приведены результаты органолептического исследования хлеба инновационного приготовления с использованием композитной муки и озонированной воды. Для создания научных основ в производстве хлеба "Композон" было проведено исследование органолептических показателей. Оценка качества хлеба проводилась на соответствие требованиям нормативных документов. Использование ионно-озонной технологии позволяет уменьшить загрязнение окружающей среды, повысить пищевую ценность хлебобулочных изделий, а также сократить материальные и энергетические ресурсы. В результате исследования было установлено, что использование ионизированной воды с композитной муки влияет на улучшение органолептических показателей качества продукта: цвет более однородный, вкус и запах выражены и ароматны, форма изделия округлая, текстура мякиша с равномерной пористостью. Пшеничный хлеб, который был изготовлен из композитной муки и с использованием озонированной воды по изученной технологии, сохраняет свежесть мякиша в течение 48 часов, имеет более низкую возможность заражения картофельной болезнью, а также характеризуется хорошими органолептическими показателями.

Ключевые слова: хлеб, композитная мука, пищевая ценность хлеба, продукт, высший сорт, органолептические показатели, качество хлеба.

Introduction

Human nutrition is the main factor of development and full existence. The creation of a system of adequate nutrition of the population is one of the leading directions of the state policy of Kazakhstan. Due to the fact that in modern society an increasing number of falsifications, products with unfavorable nutritional value are being created, the quality and trust of a particular product is being lost [1].

Bread is one of the most popular products in Kazakhstan. In this regard, this direction in the development of their business is quite popular at the moment. However, the more manufacturers of bakery products, the higher the probability that a similar product is produced, or a product created by falsification, as well as a product that does not meet the quality standards of bakery products. Consequently, the introduction of innovative technologies for creating multifunctional types of bread into the production of bakery products, which in turn have an increased nutritional value, favorably affecting the digestive organs and metabolic processes in the human body, seems to be a promising direction in solving the problem of improving public health and preventing many diseases.

Due to the fact that the problem of the quality of bread consumed by the population is quite relevant and critical, a study was conducted on the quality of bread made from premium flour and functional bread made from composite flour using ozonated water (hereinafter "Composon") [2].

The technology of making bread "Composon" consists in the fact that components such as flour and water undergo ion-ozone treatment at installations for ozonation and ionization. Ion and ozone agents are especially used for disinfection of products. One of the unique abilities of ion-ozone installations is to increase the nutritional value of products due to the ability to neutralize harmful microorganisms. Thanks to ion-ion technology, it is possible to create an environmentally friendly product. Thus, the use of this innovative installation seems to be one of the possible ways to improve the quality of bakery products.

In modern society, there are various variations and opportunities to improve the quality of bakery products, for example, the use of high-protein products in the formulation of bakery products, as well as the use of functional additives in the processing of wheat flour with high autolytic activity. One of the possible ways to improve the quality of bakery products is the introduction of multifunctional additives and non-traditional raw materials. An increase in the nutritional value of bakery products is also possible due to the use of non-standard types of raw materials, an increase in the production and technological process of making bread, the use of new types of grain raw materials and the use of various varieties of grain grinding [3].

One of the actual possibilities for improving the quality of bakery, pasta and confectionery products is the introduction of natural ingredients of vegetable and animal origin into these products, which subsequently allows to increase the nutritional value of bread, improve organoleptic and physico-chemical parameters, improve the quality of bread with low baking properties, create a group of new types of bread, and also guarantee the economical use of basic and additional raw materials [4,9,10].

The relevance of the study is that bread made from composite flour using ozonated water, i.e. Composon, is an innovative development, and through such preparation, acquires improved nutritional baking properties, acquires developed external and organoleptic characteristics. The opportunity to conduct a comparative analysis of Composon and bread made from wheat flour of the highest grade seems to be a convenient way to identify the advantages of using ion-ozone in the bakery industry, as well as to identify clearly favorable essential signs and consequences of using the technology of bread made from composite flour using ozonated water [4].

Materials and Researsh Methods

The objects of research in this work are wheat flour of the highest grade (GOST 26574-85), water, yeast, salt.

To perform the work, a standard, organoleptic research method was used. The principle of operation of the organoleptic evaluation is based on determining the appearance of the product, taste, color, crumb texture, smell and shape of the bakery product. The essential advantages of using organoleptic evaluation of bakery products are accessibility, speed of determining the values of quality indicators, as well as the absence of the need to use expensive equipment.

To create scientific foundations in the production of bread "Composon", a study of organoleptic indicators was conducted. The evaluation of the quality of bread made from wheat flour of the highest grade and "Composon" was carried out for compliance with the requirements of GOST 26987 "Organoleptic evaluation of the quality of wheat flour bread" [5].

When determining the shape of products, a round, rectangular oval must correspond to the grade and characteristics of a particular type of product.

The appearance of the bakery product should not contain splashes, bruises or furrows.

When evaluating the color of the crust of bakery products, the gradation of the shade of the product should vary from creamy yellow to bright brown.

The innovative development used in this work to increase the biological and nutritional value of the bakery product was realized on the basis of scientific achievements of ozone and ion technologies, which in turn achieved success with their experimental work [6].

The importance of the development lies in the practical implementation of ion-ozone technology, as evidenced by the results of research and prospects for its application in the production of food and agricultural products, cereals, as well as in the household sphere.

The use of ion-ozone technology makes it possible to reduce environmental pollution, increase the nutritional value of bakery products, as well as reduce material and energy resources.

Main part

Results and their discussion

The study of organoleptic parameters of bread made from composite flour using ozonated water "Composon" and a control sample of wheat flour of the highest grade was carried out.

Two types of bread "Control sample" and "Composon" were selected for a comparative study (Figure 1).

Figure 1 - №1 "Control sample", № 2 "Composon"

As can be seen from Figure 1, the appearance of product №2 "Composon" looks more suitable. In comparison with the control sample, the porosity of the bread "Composon" is more developed, without voids and seals. The color of the product "Composon" turned out to be more pronounced, close to a brown shade. The shape of the product of the control sample is more omitted and uneven in contrast to the shape of the "Composon". The shape of the product "Composon" is elongated, smooth and symmetrical.

Organoleptic evaluation of the taste and smell of "Composon" showed that the product acquires a more fragrant smell and pronounced taste.

One of the significant advantages of bread made from composite flour using ozonated water "Composon" turned out to be that the products are more airy, rise faster during the cooking process, the fermentation process of the dough also showed faster results. When comparing the time interval of raising the test, the product under control sample No. 1 showed a clear rebound with an interval of 5-10 minutes.

Organoleptic indicators of bread made of composite flour using ozonated water meet the requirements of regulatory and technical documents (Figure 2).

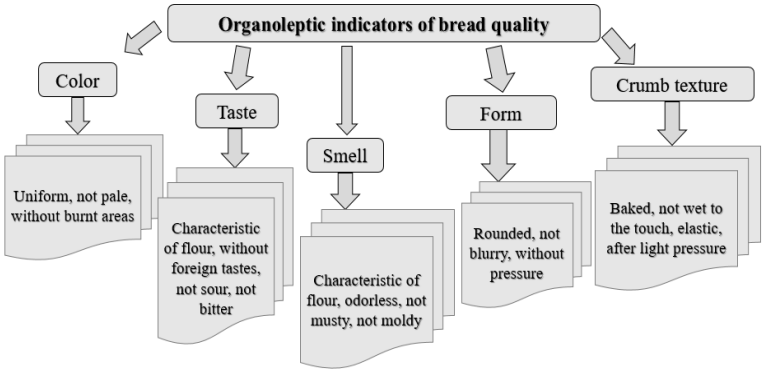

Figure 2 - Indicators of the quality of bread made of composite flour using ozonated water

Thus, as a result of the study, it was found that the use of ionized water with composite flour affects the improvement of organoleptic indicators of product quality: the color is more uniform, the taste and smell are pronounced and fragrant, the shape of the product is rounded, the texture of the crumb with uniform porosity. The acceleration of the fermentation process of the dough affects the increase in the nutritional and biological value of the resulting product [7].

Wheat bread, which was made from composite flour and using ozonated water according

to the studied technology, retains the freshness of the crumb for 48 hours, has a lower possibility of infection with potato disease, and is also characterized by good organoleptic characteristics (smell, crumb structure, taste, product shape, color) [8].

Conclusions

When comparing the control sample and the "Composon" bread, the following results were obtained:

1. The color of the product turned out to be more uniform, light yellow, not pale, without burnt areas;

2. The taste of the product meets the necessary standards, not sour, not bitter, without foreign tastes;

3. The smell of the product is fragrant, not musty, not moldy;

4. The shape of the "Composon" bread compared to the control sample turned out to be more rounded, not crumpled, without cracks, smooth;

5. The texture of the crumb of "Composon" bread is more elastic, not moist, without lumps and well baked.

The use of ozonated water in the baking industry opens up great prospects in the production of bakery products. The use of this method will reduce material and economic costs, reduce the production time of bakery products with the subsequent preservation of the nutritional value of the product, its micro, and macro elements, and also assume further preservation of the quality of bread for a longer period of time. In this regard, the use of this innovative technology for the preparation of bakery products determines the feasibility and validity of the proposed method [9,10].

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