TECHNOLOGY OF NON-TRADITIONAL PREPARATION OF BREAD AND BREAD PRODUCTS FROM GROWN GRAIN

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ТЕХНОЛОГИЯ НЕТРАДИЦИОННОГО ПРИГОТОВЛЕНИЯ ХЛЕБА И ХЛЕБНЫХ ИЗДЕЛИЙ ИЗ ВЫРАЩЕННОГО ЗЕРНА

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ABSTRACT

In this article, besides wheat and barley flour, rye flour was used in the preparation of bread and bakery products. rye flour is the most beneficial grain product for the human body, and it was found that 100 g of rye flour contains 339 calories. Rye flour is rich in dietary fiber, which aids digestion and helps regulate blood sugar levels. It also contains essential minerals such as magnesium, phosphorus, and iron, which contribute to bone health and oxygen transport in the body. Additionally, rye has a lower glycemic index compared to wheat, making it a better option for maintaining stable energy levels and managing weight. This makes rye flour not only nutritious but also advantageous for long-term health benefits.

АННОТАЦИЯ

В данной статье, помимо пшеничной и ячменной муки, в приготовлении хлеба и хлебобулочных изделий рассматривалось использование ржаной муки. Ржаная мука является наиболее полезным зерновым продуктом для организма человека. Было обнаружено, что 100 г ржаной муки содержат 339 калорий. Ржаная мука богата пищевыми волокнами, которые помогают пищеварению и регулируют уровень сахара в крови. Также мука содержит важные минералы, такие как магний, фосфор и железо, которые способствуют здоровью костей и транспорту кислорода в организме. Кроме того, у ржи более низкий гликемический индекс по сравнению с пшеницей, что делает ее лучшим вариантом для поддержания стабильного энергетического уровня и контроля веса. Это делает ржаную муку не только питательной, но и полезной для здоровья.

Keywords: laboratory mill, thermometer, sieve. SESH-3M Dryer.
Ключевые слова: лабораторная мельница, термометр, сито. Сушилка СЭШ-3М.

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Introduction. Since ancient times, people have revered bread, which is one of the main benefits of their consumption, and compared it to gold, the sun, and life, and sang hymns in its honor, saying "Bread is the sustenance of all of us. "When a guest arrives, bread is placed in front of him first. Bread is sacred. From childhood, they are taught to value its crumbs and not to waste them. Depending on which grain flour bread is made from, there are wheat bread, obi bread, patir bread, shirmoy bread.

Methods. The gluten content in high-grade bakery flour should be no less than 28%, in first-grade flour no less than 30%, and in second-grade flour no less than 25%. For obtaining pasta products the gluten content of high-grade flour obtained from high-transparency wheat used should be not less than 28%, gluten content of first-grade flour - not less than 25%, and gluten content of common wheat flour - not less than 20%. The quality of gluten should not be lower than the second group.

The amount of gluten is expressed in relation to the weight of the ground grain sample. Gluten is of two types: wet-absorbed gluten and dry gluten - the amount of gluten after drying. Depending on the gluten content, wheat grain can be classified as follows. The main part of the protein in the grain of cereal crops is insoluble in water (protein substance). Gluten consists of a flexible, sticky, and stretchy mass obtained from dough and not washed away by water. It is mainly found in wheat grain and can be up to 16-50%. Gluten consists of three amino acids: albumin, gliadin, and glutenin, which give the dough the property of swelling or porosity. Gluten in wheat grain is the reason for the good dough. In terms of quality, gluten in wheat grain is rated highest.

Results and discussion

Quality groups of gluten in wheat grain

Table 1.

IDK-1 device reading, scale unit

Qualitative unit	Gluten characteristics	from 0 to 15
3.	Very unsatisfactory	Qattiq qoniqarsiz
from 20 to 40	2.	Very satisfactory
from 45 to 75	1.	Good
from 80 to 100	2.	Weakly satisfactory
from 105 to 120	3.	Unsatisfactory

The sequence for determining the content of protein, fiber, starch, sugar, moisture, fat, and the degree of hardness in the wheat flour "Informatik-8620," which is one of these devices, is as follows: wheat, purified from all impurities, is thoroughly ground in a laboratory mill and brought to flour. Thoroughly ground wheat flour is placed in the part of the unit intended for analysis and compacted by pressing with a special press. During the operation of the equipment, a red laser beam is passed through the compressed flour, as a result of which all the particles that need to be determined in the composition of the analyzed flour sample are passed. indicators are automatically printed in a short time on the screen located on the surface of the device and, if necessary, on a sheet of paper.

Amount of wet gluten in wheat, barley, and rye grain, %

Table 2.

Grain categories

Wet gluten in grain	high gluten grain
Above 30	medium gluten content
26...29.9	grain with gluten below average
20...25.9	low gluten grain
Below 20	Determination of moisture content in the mass of wheat, barley and rye grains

The moisture content was determined according to GOST 15113.4-77.

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Moisture determination is carried out according to GOST 82041-82. Grain moisture content is the percentage ratio of the water content to its total mass. The moisture content in the grain is of great importance in the process of its storage and processing. Moist grain can quickly self-heat, and if the necessary measures are not taken in a timely manner, the composition of the grain mass can be completely disrupted. In grains with high moisture content, microorganisms and pests develop very quickly and easily. Grain with high moisture content cannot be processed. Depending on the amount of moisture in the grain, they are divided into four groups:

- dry;
- moderately dry;
- moisture;
- case.

300 g of grain is taken from the average sample and placed in a hermetically sealed container. After the grain temperature becomes equal to the ambient temperature, a part of the sample is taken, and its moisture content

is measured on a moisture meter to select the drying time and option.

To determine moisture content, two 5.0 g samples of ground wheat and rye grains are taken and heated at 130 ^{0}C for 40 minutes. Then the weighing bottles are cooled in a desiccator, measured, and their moisture content is determined by the following formula:

$$X_1 = 100 \cdot 1 - \frac{q_1 \cdot q_2}{q_2} + K$$

Here:

q1 - mass of ground grain before drying, gr; q2 - mass of the sample after drying, gr.

Determination of grain moisture content

Grain moisture is the amount of free or bound hygroscopic water contained in the grain, expressed as a percentage of the weight of the sample.

The amount of water in the grain is one of the main indicators of its quality and determines the durability of its storage. Excess water in the grain accelerates the respiration process and contributes to the development of microorganisms and storage pests in the heap. Under the influence of low temperatures, the grain loses its germination as much as possible and becomes unsuitable for sowing.

Excess moisture content in the grain (above 15.5-1.6%) is also noticeable during processing. Such grain is poorly ground, and the mill's productivity also decreases. There are 4 known states of grain moisture, which determine the storage resistance of grain, its dependence on the possibility of its processing on the standard side: 1) dry 2) semi-dry 3) wet 4) wet.

Rye grain is characterized by the following indicators: dry moisture up to 14%, moderately dry up to 14-15.5%, moisture up to 15.5-17%, and moisture more than 17%. Methods for determining grain moisture content can be divided into two groups: direct and indirect. The first group includes the amount of water in the grain by measuring its volume after preliminary displacement in special equipment.

Bread is divided into such types as wheat bread, barley bread, corn bread, rye bread, depending on which grain flour is used. We know and appreciate the beloved Uzbek flatbreads that have survived from ancient times to the present day. In Uzbek cuisine, there are flatbreads such as obi non, gijda non, patir non, and shirmoy non, depending on their preparation technology. The method of baking bread in a tandoor oven is widespread among the Uzbek people.

Non-traditional bread recipe

Table 3.

Grain types

Water ml	Flour gr	Salt gr	Sugar gr	Yeast gr	Oil gr	Rye
250	100.	5.	5.	3.	2.	Wheat
250	150.	5.	5.	3.	2.	Barley
250	200.	5.	5.	3.	2.	corn
250	250	5.	5.	3.	2.	2

Based on this recipe, in the process of heating dough particles from the dough state to the state of bread, the temperature of the heat transfer surfaces for baking bread and bakery products in the industry is 300-400 ^{oC} and the temperature of the steam-air environment of the baking chamber is approximately 200-250 ^{oC,} heat radiation and convection are applied to the baked dough particles. We will cover our article on the innovative type of baking a small amount of daily bread at home. So, first of all, we use rye malt for our flour. By the way, it would be appropriate to provide information about malt here. Malt refers to grains grown under artificial conditions at a certain temperature and humidity. Today we add rye malt flour to our flour when baking innovative bread. When using rye malt flour, it gives the bread crumb a dark brown color, a pleasant taste, and aroma.

Pour 250 ml of warm water into a medium-sized container, add 1 teaspoon of sugar, 1 teaspoon of yeast. Mix thoroughly, melt, then cover the container with a lid and let it settle in a moderately warm place for 5 minutes. Add 500 g of flour to the clarified product, add 100 g of rye malt flour, and mix well. Add 1.5 teaspoons of salt to the product according to taste, then add 20 ml of vegetable oil and mix well. As a result, the dough will be kneaded and thoroughly processed. Cover the finished dough with plastic wrap and wrap for 1-1.5 hours. The next process is as follows: using a homemade gas stove, we take a simple boiler, which is always used at home, place it on the gas stove and heat the boiler on low heat. We take the settled dough and divide it into pieces. We make two loaves of bread by treating them on a baking sheet. Heat the lid of the cauldron on a gas stove, moisten the back side of the baked bread with water, and cover the lid of the heated cauldron with the lid as if baking in a tandoor, and treat its upper side with a chisel, cut the upper part slightly from the middle part of the bread with a knife. Rub the bread with egg yolk and treat it with sesame seeds. We cover the baking sheet with bread in the pot [1]. Bake on medium heat for 15 minutes. It turns red and cooks very delicious. The bottom parts of the bread are also baked without burning. It would be advisable to cook this method in any Uzbek household without difficulty at home.

Consideration

When studying the process of heat treatment of grain raw materials with infrared radiation, Professor E.P. Tyurev (1990) developed methods and devices for a comprehensive study of the optical properties and

thermodynamic characteristics of wheat and buckwheat, established the laws of energy transfer under infrared radiation under various processing conditions [2], determined the main thermodynamic characteristics of moisture mass transfer in the grain, and determined the optimal parameters of infrared radiation. When choosing a rational type of infrared generator for grain and grain processing, Academician Yu.M. Plaxin developed a methodology for selecting elements based on well-known performance criteria and proved the expediency of using light-quartz infrared generators KGT-220-1000. They have a maximum emission with a wavelength of 1.1 μm, where the grain and the grain have the highest absorption capacity [3]. The use of infrared radiation in the technology of growing grain crops intensifies the processes, improves the quality indicators of products, and simplifies their management.

An important factor in creating a baby food product is the correct selection of raw materials. Long-term experience shows that in many indicators, the best raw material base for the production of baby food is considered [4].

Wheat is one of the most common main cereal crops. Wheat grain contains from 11% to 18-19% protein, depending on the variety. The practice of repeatedly studying the composition of rye and its use in nutrition has shown that if a person strives to be healthy, it is the first product with many beneficial properties that are difficult to find in any other. For those suffering from diseases of the lungs, throat, esophagus, stomach, chest, and bladder, it is necessary to eat rye. Constant use of rye products makes it possible to prevent the development of these diseases [5].

Amount of basic nutrients in 100 g of wheat grain, g

Table 4.

Grain types

Water	Protein	Oil	Starch	Fiber	Ash	kcal.	Rye
14.0	11.6	1.6	68.7	2.4	1.7	318.	Wheat
14.0	11.6	1.7	67.7	2.5	1.7	316.	Barley
14.0	12.7	1.6	66.6	3.4	1.7	315.	corn
14.0	12.9	1.4	67.5	2.3	1.8	320	RESULT

In conclusion, it should be noted that one of the most pressing processes today is production of advanced technologies n order to prevent shortcomings that arise in the process. Rye is a unique and healthy diet today. It is distinguished by its unique properties. Its protein contains lysine and threonine. Rye contains water, proteins, fats, and carbohydrates. The plant contains vitamin A - betacarotene, which maintains the integrity of the cell structure and protects the body from aging, thiamine, which prevents $_{B1}$, and riboflavin, which actively participates in the processes of protein, carbohydrate, and fat metabolism, $_{B2. B3}$ and PP vitamins are present. Using rye products improves cardiovascular function.

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