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UNTRADITIONAL RAW MATERIALS IN PASTA PRODUCTION TECHNOLOGY

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Annotation. These products, unlike wheat, do not contain gluten-forming substances, and therefore are usually used for the production of instant pasta or short instant products or short products using technologies. The use of inulin in functional pasta is natural. Inulin is the most widely used and studied prebiotic in the world, it is a natural plant ingredient.

***Keywords*:** Pasta, wheat grains, flour, non-traditional raw materials, triticale

By kneading dough, forming products and drying them. The main raw materials for the production of pasta are bakery flour and flour obtained by grinding soft, highly vitreous wheat [1,2,3,4].
Unconventional raw materials in the production of pasta products are an advanced direction in this industry. There is a reason for this, shortcomings in production with the main raw materials. Such as low quality of manufactured products, low biological value, increased wear of technological equipment, and many others[5,6].
Production include products of processing of grain and seeds of various plant crops (flour from corn, rice, buckwheat, oats, barley), fruits of tuberous crops, as well as by-products of their processing[7,8,9]. These products, unlike wheat, do not contain gluten-forming substances, and therefore are usually used for the production of instant pasta or short instant products or short products using technologies that provide for high drying temperatures, as well as the use of hot water during kneading[10,11].
The nutritional value of pasta, flour fortification is used. In this case, mainly egg and milk additives, heat-resistant vitamins are used. Flour is also enriched with iron and calcium[12,13].
Macaroni products are enriched with iodine by adding 3% seaweed.
Pasta products with the addition of sea kale acquire the same color as that of sea kale, while the color becomes darker with increasing dosage. At a dosage of 3%, the taste of pasta does not change, if 5% of the product gets the characteristic taste of seaweed. Seaweed is a dietary supplement that reduces the impact of adverse factors on the human body.
In addition, they are also enriched with ascorbic acid, soy flour, dry gluten and grain germ[14,15,16,17].
Triticale is a hybrid of different grains, selected by artificially crossing wheat and rye. Triticale combines the positive properties of both crops, such as high yields, nutritional value of rye, as well as the ability of proteins to form gluten with a low degree of darkening during the preparation of products, which applies to wheat[18,19].
The use of inulin in functional pasta is natural. Inulin is the most widely used and studied prebiotic in the world, it is a natural plant ingredient. It is able to improve the functioning of the digestive tract, helps to increase immunity, reduces cholesterol levels in the blood [20,21].

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Inulin has a neutral taste, neutral color, which does not affect the appearance of the finished product [22].

In addition to the health-improving effect when inulin is added to pasta, it provides a number of technological advantages: when cooking pasta, it does not deform, the strength of dry products. The optimal dosage of inulin is 2-3% by weight of flour. This is the optimal dosage for the best manifestation of technological and health-promoting properties [23,24].

Oats, barley, rice, and corn belong to the group of cereals. In addition to the differences in the chemical composition of the grain of these crops, and therefore the grinding products, it is necessary to note differences in the structure of their main component starch: it differs in the ratio of amylose and amylopectin, in the temperature of gelatinization and the size of granules [25,26].

Peas and soybeans are legumes that are distinguished by their high protein content. At the same time, it should be noted the high value of soy proteins, which are close to the composition of animal proteins in terms of their amino acid composition (including the content of essential amino acids) [27,28,29].

Vegetable and berry powders are a source of enriching pasta with minerals, dietary fiber, vitamins, and organic acids.

To get the powder, the raw material is first dried, then crushed. Powders have a higher moisture absorption capacity than baking flour[30,31].

As a food processing additive, amaranth processing products of grain and/or vegetable varieties are used, and phosphoric acid salts in the amount of 0.03-1.00% by weight of flour are used as a corrective additive[32,33]. The use of enriching additives from amaranth makes it possible to increase the biological value of pasta products, expand their range, and reduce the microbiological contamination of the finished product[34,35].

Amaranth is considered a promising raw material for the food industry. It contains 15-20% protein, balanced in amino acid composition, is characterized by a high content of pectin, coloring pigments, oil with medicinal properties, vitamins A, B, C and other physiologically active substances.

Unconventional raw material, sea buckthorn meal can be used – a dry residue obtained during the production of sea buckthorn oil, which has a high biological activity, has a high content of organic substances[36,37].

tread properties. Sea buckthorn meal is a solid, loose product of yellow color. from the technological point of view, meal has a number of advantages: it has a high degree of hydration, it can be used in different amounts and combinations as part of food compositions[38,39]. As part of flour products, it not only increases the biological value, but also reduces the content of energy-intensive components, while maintaining the quality of products. In addition, meal has a number of advantages over raw materials: taking up 4-5 times less volume, it allows you to get significant savings by reducing production space and storage costs. Sea buckthorn meal is a natural vegetable source of dietary fiber, minerals, vitamins, vegetable protein, fiber, pectin substances, an antioxidant of fats and a moisture stabilizer[40].

In order to develop new, cheaper additives for pasta products, providing a cheaper technology for the production of pasta products with their introduction, ensuring the preservation of the biological value of additives, as well as improving the quality of pasta products, in particular color and cooking properties. Such additives include a product of whey processing, called SGOL-hydrolyzed whey.

The main raw material was wheat baking flour of the highest grade. SGOL was added in the amount of 5-15% to the flour. Kneading was carried out at a water temperature of 40-50 °C, the estimated

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humidity of the dough is 32%, the duration of kneading is 10 minutes. The molded raw vermicelli was dried in a drying cabinet at 30, 50 and 80 °C for 6 hours, 2 hours and 40 minutes, respectively, to a humidity of 14-14. 5%.

When adding the fermented milk product SGOL to pasta, the nutritional value increases, they acquire an attractive yellow color, the intensity of which increases when using high-temperature kneading and drying modes of products. At the same time, the introduction of salt contributes to an increase in the acidity of pasta, but leads to a weakening of the structure, loss of substances in the cooking water within acceptable limits, and sticking of products is observed. In this regard, it is recommended to add 5-10% to baking flour [41,42].

From the review of literature sources on the use of non-traditional raw materials in pasta production, it can be noted that various natural sources can be used as raw materials. Which are added to pasta in certain quantities, and these additives have an impact on changing the properties of pasta, their enrichment with certain minerals, vitamins, etc. The structural, mechanical and cooking properties of pasta depend on the introduction of a certain amount of additives.

Fortification of inexpensive food products, such as pasta, is advisable due to their mass consumption, not high cost this product. This implies the possibility of preventing a number of diseases and preventing beriberi among pasta consumers[43,44].

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