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# RATIONAL USE OF SECONDARY PRODUCTS IN THE PRODUCTION OF BREAD PRODUCTS

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**Abstract**
In this article, a nutritional powder from the pomace of various grape varieties was obtained in laboratory conditions and its chemical composition was analyzed. The food powder obtained from the pomace of grapes was added to wheat flour bread and its effect on quality indicators was studied.

**Keywords**: Bread, grape varieties, grape pomace, chemical compostion, food powder, drying, nutritional value, porosity, acidity, specific volume.

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## Introduction

Today, the rational use of intermediate products and waste of the food industry is one of the most important problems. The integrated use of non-traditional raw materials is relevant for all sectors of the national economy. For many years, traditional raw materials in bread production have been flour, salt, yeast, sugar, various oils, milk, as well as additives. In recent years, thanks to the introduction of waste-free technologies and the integrated processing of agricultural raw materials, new food products with a complete chemical composition containing biologically active substances have been obtained. This new raw material, which is not traditional for the baking industry, can serve as a valuable additive in bread production. It can be used to increase the nutritional value of bread, improve its organoleptic and physicochemical properties, create new products for therapeutic and prophylactic purposes, activate the technological process of bread making, as an improver when processing flour from poor-quality grain or when introducing components into the dough that negatively affect the consumer quality of bread.

As a result of grape processing, secondary products are formed: grape pomace, skins, seeds, and grape juice, resulting in fermentation, sediment, and other waste. These wastes account for 20% of the volume of processed grapes. Depending on the technological process of grape processing, sweet and fermented grape pomace are obtained. Sweet pomace is called white or sweet pomace, it does not contain alcohol, but only sugar. In most cases, sweet pomace is understood as the part remaining after pressing white grape varieties to make white wine or grape juice.

When processing grapes in the red method, the grape pomace contains almost no sugar, only alcohol. The pomace that remains after the fermentation of red grape varieties is called fermented pomace.

For this purpose, grape radish, a waste product of the wine industry, was dried, nutritional powder was obtained and added to bread to increase its nutritional value, and the chemical composition and rheological properties of the bread were studied. Grape radish obtained from white grape varieties was used in the study. The technology for obtaining a food additive in the

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form of powder from grape radish in laboratory conditions was carried out in the following sequential stages: grape radish was dried in a SESH-3M drying cabinet at a temperature of 60-70 0C for 4-6 hours, depending on its moisture content, sieved in sieves to separate grape seeds from the skin (d1=14, d2=12 mm), grape radish was ground in a LMT-1 laboratory mill and the additive was obtained in the form of a powder mixture. Powder with a uniform dispersion composition, particle size from 30 to 160 microns, moisture content 8.0-10.0%, light brown, sweet and sour taste, pleasant grape smell. According to sanitary and hygienic quality indicators, this raw material meets the requirements of SanPiN No. 0366-19 and TR TS 021/2011.

The chemical composition of the nutritional powder was studied to confirm the feasibility of using nutritional powder from grape radish as an additive in the production of bread and bakery products.

**Table 1. Chemical composition of nutritional powder from radishes of white grape varieties**

| Indicators | Grape varieties of radishes | |
|---|---|---|
| | Rkatsiteli | Bayan-Shirey |
| Total sugar, including in %: | 75,4 | 74,8 |
| Sucrose,% | 5,7 | 5,1 |
| Fructose,% | 17,9 | 18,4 |
| Glucose,% | 20,5 | 20,4 |
| Pectin substances,% | 10,7 | 10,4 |
| Dietary fiber (fiber),% | 20,6 | 20,5 |
| Acidity,% | 4,3 | 4,2 |
| Content of tannins and coloring substances,% | 0,3 | 0,2 |
| Content of minerals, mg %: | | |
| iron | 14,3 | 14,5 |
| sodium | 10,41 | 10,32 |
| calcium | 75,6 | 76,1 |
| magnesium | 70,8 | 69,8 |
| phosphorus | 13,20 | 12,7 |
| Content of vitamins,%: | | |
| Ascorbic acid (vitamin C) | 15,7 | 16,4 |
| -carotene (vitamin A) | 16,8 | 16,9 |
| Pyridoxine (B6) | 0,07 | 0,07 |

As can be seen from the table, the main component of the nutritional powder obtained from grape radish is carbohydrates, mainly consisting of pectin substances and dietary fiber. Mineral substances and vitamins, which are catalysts and bioregulators of processes occurring in a living organism, are present in significant quantities.

Dietary fiber (fiber) affects intestinal peristalsis, creates the necessary conditions for food to move through the gastrointestinal tract. They help to remove cholesterol from the body, prevent the absorption of toxic substances. Deficiency of dietary fiber (fiber) leads to obesity, gallstone disease, cardiovascular diseases, and the increase in the incidence of colon cancer is also associated with their deficiency.

The abundance of pectin substances and dietary fiber serves to improve the quality of finished

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bakery products and extend their shelf life.

Test laboratory breads were baked to determine the effect of different amounts of nutritional powder obtained from white grape varieties on the organoleptic and physicochemical parameters of bread made from wheat flour.

**Table 2. Effect of different amounts of nutritional powder from white grape varieties on the quality of bread made from wheat flour**

| Bread indicators | Control | Relative volume, cm3/100 g | | |
|---|---|---|---|---|
| | | 1,5 | 3 | 5 |
| Relative volume, cm3/100 g | 310 | 312 | 325 | 320 |
| Humidity, % | 44 | 44 | 44,1 | 44,1 |
| Acidity, degree | 2,5 | 2,7 | 2,8 | 3,2 |
| Porosity,% | 75 | 77 | 80 | 78 |

The results showed that the bread containing nutritional powder from white grape varieties had higher physical and chemical parameters, namely specific volume, porosity and acidity, than the control bread. When we added nutritional powder in an amount of 5%, the bread crumb turned dark. Therefore, it is recommended to add 3% of nutritional powder to bread made from wheat flour. In addition to the amount of nutritional powder added to bread, the method of adding it also affects the physical and chemical parameters of bread.

**Table 3. Effect of the method of adding nutritional powder from white grape radish on the quality of bread**

| Indicators | Addition method | | |
|---|---|---|---|
| | In dry powder form | In the form of an aqueous suspension | Mixed with yeast suspension |
| Acidity,% | 2,8 | 2,8 | 2,8 |
| Porosity,% | 80 | 82 | 83 |
| Shape stability, (H/D) | 0,55 | 0,6 | 0,6 |
| Relative volume, cm3/100 g | 325 | 335 | 340 |

Bread samples prepared by mixing nutritional powder from grape radish in the form of an aqueous suspension and yeast suspension were the best in terms of organoleptic and physicochemical indicators.

Bread samples were distinguished by a large specific volume, soft elastic core. Also, the structural and mechanical properties and porosity of the core improved.

Based on the conducted studies, it can be concluded that adding nutritional powder from grape radish in the recommended amount to bread made from wheat flour allows you to obtain bakery products with high organoleptic and physicochemical indicators, enriched with minerals and vitamins. The use of nutritional powder from grape radish in bread production improves product





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quality and allows you to expand the range of manufactured products.

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