**BUTLEROV HERITAGE**

***Butlerov Communications C***
*Advances in Biochemistry & Technologies*
ISSN 2074-0948 (print)

**2021**. Vol.1, No.2, Id.15.
Journal Homepage: https://c-journal.butlerov.com/

*Thematic section:* Biochemical Research.
*Subsection:* Biochemistry.

**Full Paper**

*The Reference Object Identifier* – ROI-jbc-C/21-1-2-15
*The Digital Object Identifier* – DOI: 10.37952/ROI-jbc-C/21-1-2-15
Received 10 May 2021; Accepted 12 May 2021

# The use of barley flour in the production of wheat bread. Features of fermentation

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***Keywords:*** barley flour, wheat flour, moisture, acidity, water absorption capacity, gas forming capacity, baker's yeast.

## Abstract

As a result of the research, the possibility of changing the chemical composition of the flour mixture by replacing part of the wheat flour with barley flour in order to obtain a functional product has been shown. A complex of studies was carried out aimed at studying the characteristics of fermentation when changing the composition of the initial flour raw materials. Replacing 20% wheat flour with barley flour does not significantly affect such indicators of the flour mixture as acidity and moisture and the water absorption capacity of the flour mixture. More significant differences were noted during the fermentation stage. A slight decrease in the volume of dough pieces was noted in the case of using barley flour. It has been shown that in this case more active yeast growth and carbon dioxide release at the beginning of fermentation are observed. However, after 1.5 hours of fermentation, the number of yeast cells and the rate of carbon dioxide evolution in the dough mixed with a flour mixture with barley flour decreases compared to the control. Throughout the entire fermentation process, the acidity of the dough with barley flour was slightly higher than the control, which is most likely associated with the more active development of lactic acid bacteria. The noted differences are associated with a complex of factors of biochemical and microbiological nature. First of all, this includes differences in the composition of proteins and carbohydrates of wheat and barley flour. Barley flour is characterized by a higher content of low molecular weight carbohydrates compared to wheat flour. These include glucose, fructose, maltose. They provide a more active development of the yeast, accompanied by a more intense release of carbon dioxide, at the beginning of fermentation. However, due to the coarseness of barley flour grinding, the availability of starch grains for attack by amylolytic enzymes was reduced, which did not allow sufficient yeast nutrition at the end of fermentation. In addition, barley flour is characterized by a high content of β-

glucans, which are absent in wheat flour, as well as an increased level of arabinoxylans. These non-starchy polysaccharides do not contribute to the formation of a strong protein skeleton of the dough. As a result, the volume of fermented blanks using barley flour was lower than in the control.

**For citation:** Dmitry A. Samusik, Maria A. Berezina, Alla Yu. Krynitskaya, Azat V. Fayziev, Ekaterina V. Kolesnikova, Ezhe D. Zaripova. The use of barley flour in the production of wheat bread. Features of fermentation. *Butlerov Communications C.* **2021**. Vol.1. No.2. Id.15. DOI: 10.37952/ROI-jbc-C/21-1-2-15

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