

RESEARCH OF BAKING PROPERTIES OF WHEAT FLOUR

¹G.K.Tukhtamishova, ²D.Jabbarova

¹Lecturer of the Department of Food Technologies of Gulistan State University

²Bukhara Institute of Engineering and Technology, Assistant of the Department of Food Technologies

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Abstract. *This is especially true for small capacity enterprises and mini bakeries where the problem of improving the quality of finished products is particularly acute due to the specific features of production small capacities and accelerated technologies. The urgency of problem is determined by the need to study the effect of one component improvers of the quality of bread made from soft wheat grown in the natural and climatic conditions of Uzbekistan and developing their optimal dosages to ensure the production of bakery products with high quality indicators.*

Keywords: *product, technologies, wheat, mini bakeries.*

The baking quality of wheat flour is mainly determined by the following properties: gas-forming ability; the ability to form dough with certain rheological properties (flour strength).

The purpose and objectives of the research. The purpose of these studies is to study the effect of single-component bread improvers on its quality.

In accordance with the set goal, the main directions of research and experimental work with the solution of the following tasks were determined:

- study of baking properties of individual batches of grain cultivated in Uzbekistan;
- study of the quality of bread made from flour with reduced baking properties;

Objects of research: wheat flour with reduced baking properties, one-component baking improver - ascorbic acid, dough and bakery products made from flour with reduced baking properties.

Scientific novelty. On the basis of experimental studies and theoretical generalization and analysis of published literature data, dosages and methods of using baking improvers of oxidative action in the processing of flour with reduced baking properties with weak gluten and reduced enzymatic activity are scientifically substantiated.

The results obtained and their analysis

The gas-forming ability of flour is of great technological importance in the production of bread, the formulation of which does not provide for the introduction of sugar into the dough. It depends on the state of its carbohydrate-amylase complex, including carbohydrates, the activity of amylolytic enzymes and, in general, on the sugar-forming ability of flour.

During fermentation in the dough, as a result of the vital activity of yeast cells, ethyl alcohol and carbon dioxide are formed as the final products of carbohydrate fermentation, by the amount of which the intensity of alcoholic fermentation is judged.

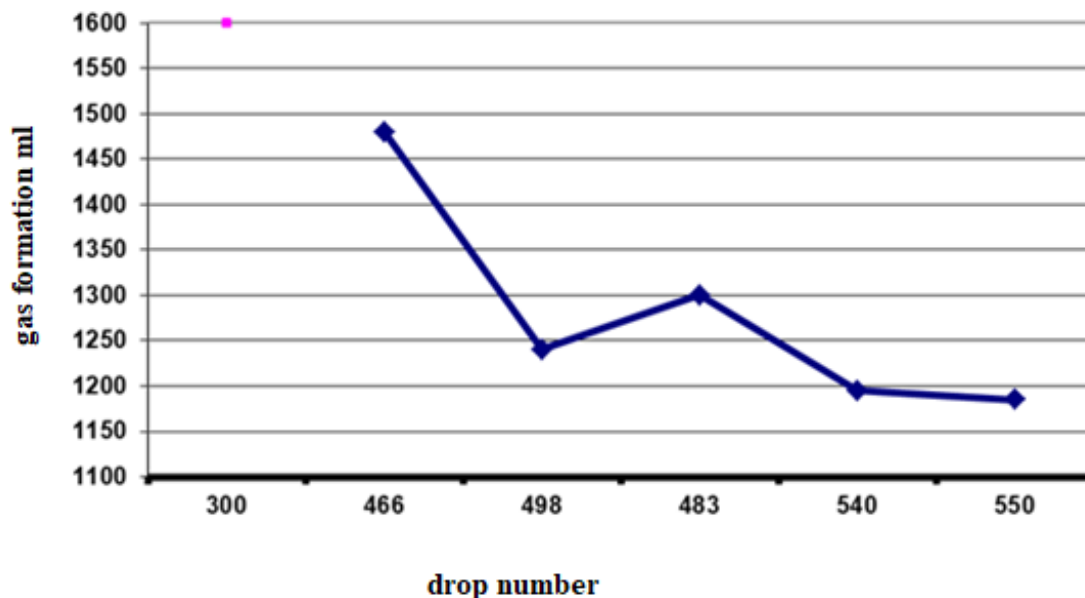
The gas-forming ability is characterized by the amount of carbon dioxide (CO₂) released over a set period of time during the fermentation of dough from certain amounts of flour, water and yeast.

Knowing the gas-forming ability of the processed flour, it is possible to foresee the intensity of fermentation of the dough from this flour, the course of proofing and baking, the

intensity of the color of the crust, the looseness of the crumb and the volume of bread. It is believed that when displacing from 1300 to 1600 ml of the solution, flour has an average, and over 1600 ml – a large gas-forming capacity. The study determined the gas-forming ability of flour and its dependence on the value of the number of drops Fig.1).

Fig. 1.

The gas-forming ability of flour and its dependence on the value of the number of drops



The data of Diagram 1 show that the more the grain is affected by drying, the insufficient its gas-forming ability.

Thus, the gas-forming ability of flour (sample 1) with the number of drops of 466 seconds was 1480 ml. With an increase in the number of drops of flour (sample 2) by 32 seconds compared to flour (sample 1), the gas-forming ability decreased by 240 ml; in flour (sample 3), with an increase in the number of drops by 17 seconds, the gas-forming ability decreased by 180 ml; in flour samples 4 and 5, where the indicators of the number of drops increased against flour (sample 1) for 74 and 84 seconds, the gas formation index decreases by 285 and 295 ml, respectively.

Thus, the study determined that flour samples (samples 1 and 3) have an average gas-forming ability, and flour (samples 2,4,5) have a low gas-forming ability.

In the baking process, partial gelatinization of starch is of great importance, which causes the formation of an elastic crumb of bread.

Further, we conducted a study of the state of starch and the temperature of its gelatinization (Table 1). The work was carried out on the device

Amylograph

These amylograms simultaneously reflect the degree of starch swelling, the course of its gelatinization and the action of amylolytic enzymes.

Table 1.

The effect of the starch state and the temperature of its gelatinization on the gas-forming ability of flour

Flour samples	Amylograph indicators	
	gelatinization temperature, °S	viscosity of starch paste, E.a
1	72	920
2	68	1100
3	68	1010
4	65	1230
5	62	1539

The shape of the amylogram is influenced by the action of amylolytic enzymes, which break down starch to dextrins, thereby reducing the viscosity of flour baltushka. It is believed that with good flour quality, the gelatinization temperature is 80-85°C and the viscosity of starch paste is 400-600 e.a. With average flour quality, these indicators are 70-80 °C and 600-800 e.a.; and with poor quality – less than 70 OS and more than 800 e.a. respectively.

The flour quality groups were determined by the height of the amylograms.

The results of the Amylograph device (Table.1) it is shown that in flour (sample 1) the gelatinization temperature was 72 ° C and it can be attributed to medium-quality flour, however, the height of the device showed that the viscosity of starch paste is 920 e.a. which confirms the weak activity of amylolytic enzymes.

All other flour samples (2,3,4,5) according to the gelatinization temperature and the viscosity of the paste are characterized as flour with reduced enzymatic activity.

Thus, the study showed that flour samples have low activity of their own enzyme – alpha-amylase, which

are characteristic of processing grain grown in hot and dry weather.

The ability of flour to form a dough that has certain rheological properties after kneading and during fermentation and proofing is considered the "power" of flour.

Conclusions. It was determined that grain samples grown in the republic were affected by the bug-turtle to varying degrees, which affected the protein-proteinase complex of flour, providing the state and change of protein substances of flour and the physical properties of the dough.

The amount of gluten flour was in the range of 20-26%, the quality of gluten 93-115 units of the device IDK. The test blanks in the proofing were greatly liquefied and blurred. Baked bread of hearth products had a small volume, insufficiently developed porosity, inelastic jamming crumb. The volumetric yield of molded bread was 286-283 cm³;

It was revealed that the hot climate of grain cultivation affected the changes in flour, the state of the carbohydrate-amylase complex and the reduced activity of amylolytic enzymes. As a result, in the process of dough preparation, the attack of protein substances in flour increased, the effect of enzymes on starch was weakened, there was a lack of sugars necessary for fermentation, the rheological properties of the dough worsened, the quality of bread decreased.

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