

# Effect of Complex Supplements on the Rheological Properties of Dough

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**Abstract---** In Kazakhstan, one of the most consumed product is a bakery, in connection with the increase in their range with antidiabetic appointment is an important task, since increases every year in Kazakhstan people suffering from diabetes. One of the efficient ways to solve this problem is the development of high-performance technology bakery production antidiabetic action using a set of Herbal Supplements, to address this issue requires the use of biotechnology and electrical methods in the manufacture of complex additives used in bakery products antidiabetic action. We have shown the influence of the complex herbal supplements on the rheological properties of dough.

**Keywords---**Supplements complex, rheological properties of dough, farinograph.

## I. INTRODUCTION

**I**MPLEMENTATION tasks increase the range and quality of products contributes to the functional purpose of the application of different types of additives. Opportunities for the creation of diabetic products opens the application of various plants and their products that have a hypoglycemic effect. Currently there are more than 150 species of plants. Their mechanism of action is poorly understood. Medicinal plants contain a complex of active substances, which have a positive impact not only on the carbohydrate metabolism, but also other types of metabolism, improve the function of the cardiovascular and central nervous system, liver and other organs have complex therapeutic effect with minimal side effects. So over the years they were used in folk medicine of different countries for the treatment of diabetes [1].

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It is noted that for the past 10 years, diabetes has become one of the most urgent health problem in most developed countries. In this context, the problem of the development of specialized products with a certain specified composition for therapeutic feeding of patients with diabetes is of particular relevance.

One of the efficient ways to solve this problem is to develop a range of diabetic bakery products [2].

Creating a diabetic bakery products is essential to solving problems of practical medicine in this direction. However, to date, the need for the production of various food health, medical and protective destination is satisfied only in part. [1]

For diet and nutrition diabetic patients and people at risk, as well as to improve the culture of food in many countries are searching diabetic natural sweeteners and preservatives. It has long been known diabetic properties of stevia leaves, rose hips, Jerusalem artichoke and celery root.

As a result of patent information research revealed that the production of bakery products antidiabetic actions apply herbal supplements in the form of aqueous extract, dried leaves and powders.

Studies on the development of a multi-component complex herbal supplements have not been conducted. Due to the above, the complex of herbal supplements with the use of biotechnology and electrical methods that allow you to save all the useful nutrients and obtain a homogeneous mass.

## II. MATERIALS And Methods

Object of research are wheat flour of the first grade, complex herbal supplements. The base of the Kazakh Scientific Research Institute of processing and food industry equipped with modern devices for determining the quality of flour, property evaluation test. Experimental studies were carried out using a Brabender farinograph. Thanks to the software allow you to bring farinograph control the physical properties of the flour to a new level. [3] With farinograph can detect a change of the physical properties of the test on its resistance to mechanical stress when mixing blades, i.e., test behavior under mechanical load in a manufacturing process. Farinograph records formation and behavior of the test under constant mechanical load. The curves obtained from tests of the test - farinogrammy - allow the quality of the flour on the following parameters: water absorption capacity, the formation and stability of the test, resistance test, the dilution of the test [4].

Farinograph also pozvolyaetopredelit how much water can absorb and what flour dough development and stabilization.

### III. RESULTS AND DISCUSSION

The authors have developed a technology of domestic bakery products antidiabetic action using a set of Herbal Supplements produced by biotechnological and electrophysical methods.

Under laboratory conditions, we studied the effect introduced by the complex herbal supplements on the rheological properties of dough.

Further studied the rheological properties of dough using a set of Herbal Supplements on the device Brabender farinograph firm. Physical properties of the test are important in the process of mixing, cutting and baking. In the experiment on the effect of the complex supplements on the physical properties of the test were included options with the introduction of complex Supplements 5,10,15,20% by weight of water. The study used wheat flour baking first grade.

The experimental data are shown in the table.

Test 1 - control,

Test 2 - 5% by weight of the complex supplements water

Test 3 - 10% by weight of the complex supplements water

Test 4 - 15% by weight of the complex supplements water

Test 5 - 20% by weight of the complex supplements water.

TABLE I  
EFFECT OF COMPLEX SUPPLEMENTS TO CHANGE THE  
PHYSICAL PROPERTIES OF WHEAT DOUGH

Name of sample flour	Water absorption (adjusted to 500 FU)	Water Absorption, % (corrected to 14% moisture)	Development time, min.	Stability, min	The degree of deviation (Tolerance index TED), [FU]	Number farinograph quality
Test 1	59,8	59,8	1,2	0,8	127	11
Test 2	52,7	52,7	9,7	12,3	40	136
Test 3	56,2	56,2	7,2	8,7	71	76
Test 4	54,9	54,9	7,0	8,8	58	96
Test 5	56,1	56,1	0,9	7,6	33	8

### IV. CONCLUSION

Shows the dependence of water-retaining amount of water added to achieve consistency in 500 FE, which is expressed in milliliters: 100 g of flour with a moisture content of 14% and further with water absorption of more than 56% - this is the good quality of gluten, which allows good volumes baking. When water absorption of less than 52% - is expected to fall of the final product. According to the research it is clear that in all experimental variants water absorption was higher than 52%, indicating a good quality of gluten.

According to the results of the table, when making complex Supplements water absorption capacity value decreases as the dose of 5, 10, 15, and 20% respectively of the complex supplements: 7.1; 3.6; 4.9; 3.7%.

Forming time test (Development) - this time from the start of adding water to the point on the curve immediately before the appearance of the first signs of declining dough consistency. When added in an amount of 5, 10, 15% complex supplements this value is increased by 8.5; 6.0; 5.8 min, while adding 20% complex supplements reduced by 0.3 min. Image

formation test time leads to increased stability of the test and the absence of dilution of the test. Stability (stability test time or the time between the first and second point of intersection of the upper curve with the line farinogram consistency of 500 FU) characterizes the stability of flour to knead. In this case, the addition set Supplements 5-20% by weight of the water increases to 11.5; 7.9 8.0; 6.8 min. Thus, adding 5-20% by weight of water complex supplements necessary to increase the batch time.

The degree of dilution of the test (the deviation) is also an important quality characteristic test. Reducing this parameter when using complex supplements indicating the strengthening of the physical properties of the resulting intermediate product, which has a positive effect on the quality characteristics of the finished bread. When making 5, 10, 15, 20% complex Supplements degree of dilution of the test decreases, respectively, in 3; 2; 2 and 4 times [FU].

Quality Score flour (number of quality) can be used with or instead of the stability and the degree of dilution, there is a high correlation with the stability of the quality index and the degree of dilution [GOST 51404-99], which is confirmed by the experiments. When administered to 5% of the complex number Supplements flour quality farinograph increases 12 times, while 10% of the complex Supplements - 6.9 times, at 15% of the complex Supplements - 8.7 times, at 20% set 1.3 times bioadditive-. Thus, as the quality of the room is a calculated value (this is the distance in mm along the time axis between the point of addition of water and the point where the value of the center farinogram decreased by 30 FU compared connotation farinogram center at the desired value consistency), it is not always adequately reflect as the test meal. Number farinograph quality expresses outline farinogram one value. Weak flour, softened early and fast, low room quality. Strong flour, softened late and slowly, the high number of quality. The obtained data may indicate that the addition of complex supplements significantly affect the change in physical properties of flour.

As seen from the table, the best option is to make a 15% by weight of the complex Supplements water. Thus, these data suggest that the addition of complex supplements has a significant impact on the change in physical properties of flour, using complex bioadditive happens strengthening the physical properties of the resulting intermediate product, which has a positive effect on the quality characteristics of the finished bread.

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