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USE OF FOOD ADDITIVES AND IMPROVERS IN THE PRODUCTION OF CRUISERS

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Abstract: Article the possibility of using a food additive in the production of flour products is considered. Research results of studying the effect of additives-improvers of this series on the quality of sugar products are presented. It is established that the use of these additives improves the quality of products.

Keywords: chemical composition, quality, food additive, sugar products.

Being shelf- stable products, they are in great demand among people of all ages due to their high taste and nutritional properties. The correct organization of the production of these products and the economical use of its own raw materials are the priority tasks of the industry, the solution of which determines the quality of the product and its cost, and, consequently, the growth of profits of bakery enterprises, their competitiveness and the ability to enter new consumer markets.

A way to improve the consumer benefits of cracked products is to use various additives, including those of non-nutritive origin, positioned as improvers of the quality of these products [1,2,3].

Attention is paid to the production of natural additives from plant, including secondary, raw materials.

A food additive that is a universal improver of a new generation and consists mainly of natural components: soy flour, enzymes (amylase and heme and - cellulase), ascorbic acid, dextrose, as well as calcium carbonate and emulsifier [1,4,5]. The ratio and composition of the components of the additive provide an effect on the components of flour throughout the processes of dough preparation and baking, which significantly distinguishes it from previously known and widely used additives [1,2,6].

The influence of improver additives of the “Baraka-1000” series on the quality of butter crackers was studied.

Table 1.

Chemical composition and energy value of the food additive "Baraka -1000"

Chemical composition	***Mass fraction of substances in 100 g of product***
Water, g	3.11
Proteins, g	24.22
Fats, g	6.65
Carbohydrates, g	45.46
Dietary fiber, g	2.37
Ash, g	0.10
Energy value, cal	579.2

Under laboratory conditions, shortbread crackers “Dorozhnye” were prepared from first grade wheat flour using the sponge method according to the method described in the collection of recipes [7,8]. The dose of additive was 0.3...0.5% by weight of flour. The comparison samples were semi-finished products and products without additives [1,9,10].

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Samples of rusk slabs and finished products baked in laboratory conditions were analyzed for organoleptic, physicochemical and rheological parameters according to the methods given in GOST 7128-91, 5670-96, 8494-91, 8494-96 and laboratory workshop [11,12,13].

The fragility of crackers was determined using a Plastics device Bending Testers according to the instructions for the device. Determination of changes in the structural and mechanical properties of cracked boards during the curing process and finished products was carried out according to the method developed [14,15].

It was established that the dosage of the additive under study had a certain effect on the quality indicators of crackers. The results of the study of quality indicators of crackers and crackers are given in table. 2.3.

Table 2.

The influence of different dosages of "Baraka-1000" on the quality indicators of crackers and crackers

he name of indicators	***ndicators of crackers and crackers prepared***				
	ithout	***ith the addition of improver , % by weight***			
	dditives	***1***	***3***	***5***	***7***
usk plates					
umidity, %	7.5	7.3	7.2	7.0	7.3
cidity, degrees	4	4	6	8	8
pecific volume, cm ^{3} /100 g	40	45	56	60	52
rackers					
umidity, no more, %	2.0	1.8	1.9	2.2	2.0
cidity, no more, degrees	6	8	8	0	3
Vetness in water at a temperature of 60 ^{o} C,	20	16	14	12	18
ragility , units	5	5	3	9	3
rganoleptic evaluation, score	3	3	9	0	7

Baking data (Table 2) showed that adding an additive to the dough in an amount of 0.1 to 0.7% of the recipe amount of flour in increments of 0.2%, along with a positive effect on the dough ripening process, allows us to obtain finished products improved quality [16,17,18]. Thus, the products were distinguished by a well-developed thin-walled porosity structure, intense color of the crust, golden color of the crumb, pleasant taste and aroma that lasted longer than usual. Increasing the dosage of the studied additive by more than 0.7% is not advisable due to the deterioration of indicators characterizing the quality of the finished product. Thus, in products of this option, a decrease in the indicator of wetness in water was found on average by 1.7%, fragility - by 12.6% compared to the control [19,20,21].

Next, a comparative assessment of the porous structure of crackers and finished products prepared with the additive under study was carried out according to the following indicators: average shrinkage coefficient *p*, characterizing the moisture content of crackers and crackers;

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respectively, porosity and density of freshly baked and cooled rusk boards N_{XCb} (%) and p_{XCb} (g/cm ^{3}); porosity and density of the dry frame N_{XC} and p_{XC}; average value of moisture shrinkage coefficient *and* in a narrow range of changes in moisture content; the number of pores per unit mass of the dried sample (Table 3).

Table 3.

The influence of the additive on the structural characteristics of slabs and breadcrumbs

Variants of samples prepared with the additive , in % by weight of flour	***Structural and mechanical properties***						
	crumb slabs				***crackers***		
	^{R} *XCb*	*RXS*	*RSK*	*LNgen eral*	*XXC*	*Nxc*	*A*
Without additive	0.182	0.151	0.822	47.0	0.94	0.82	3.1
0.1	0.176	0.134	0.593	39.0	0.89	0.77	2.29
0.3	0.170	0.130	0.691	40.0	0.92	0.80	2.32
0.5	0.170	0.130	0.784	45.0	0.95	0.83	2.80
0.7	0.181	0.140	0.756	43.0	0.93	0.81	2.41

Analysis of the results obtained showed that the slabs and crackers baked from them, prepared with the addition of PAP and EAP, had certain differences [22,23]. The highest quality of the porous structure was observed in samples prepared with the addition of 5% PAP and 25% EAP. In these variants, the slabs and crackers were characterized by more uniform and thin-walled porosity, had the smallest pore area according to the probability distribution 8 $_f$ = 0.25-0.26 mm ^{2} , and had good structural and mechanical properties [24,25,26].

Thus, the products were distinguished by a well-developed thin-walled porosity structure, intense color of the crust, golden color of the crumb, pleasant taste and aroma that lasted longer than usual. Increasing the dosage of the studied additive by more than 0.7% is not advisable due to the deterioration of indicators characterizing the quality of the finished product. Thus, in products of this option, a decrease in the indicator of wetness in water was found on average by 1.7%, fragility - by 12.6% compared to the control [27,28].

Samples with 1, 3, 7% PAP and 50% EAP also had a fairly good structure. The samples with 10% PAP were of comparatively worse quality [29,30]. These samples clearly differed in structural and mechanical properties (LN $_{total}$ = 45 inc. units, and A Htot = 47 inc. units , *Pcs* = 0.78 g/cm ^{3} and p_c = 0.82 g/cm3), largest pore area probability distribution (Scp =0.55-0.56mm^2 and S cp = 0.44-0.45 mm^2).

The difference in the quality of the porous structure of slabs and crackers is due to changes in the properties of the dough [31,32,33].

The highest quality of the porous structure was observed in samples prepared with the addition of 0% EAP. In these options, the slabs and crackers were characterized by more uniform and thin-walled porosity, had the smallest pore area according to the probability distribution (Fig. 12)Sav=0.25-26 mm^2, good structural and mechanical properties (Htotal = 39 units approx.; p_{kC} = 0.59 g/cm^3) [34,35,36].

The samples with 1, 3, and 7% PAP and 50% EAP also had a fairly good structure . The samples with 10% PAP were of comparatively worse quality. These samples clearly differed in structural and mechanical properties (*LN^ = 45* units approx ., and A Ntot = 47 units. approx ., *p*

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$_{KS}$ = 0.78 g/cm ^{3} and p_{KS} = 0.82 g/cm ^{3}), the largest pore area probability distribution (S cp =0.55-0.56 mm^2 and S cp = 0.44-0.45 mm^2). The difference in the quality of the porous structure of slabs and crackers is due to changes in the properties of the dough [37].

Analysis of the data obtained showed that the quality of rusk slabs and crackers was not inferior to the control variant when the test powder was added to the dough in an amount of 5% by weight of flour. Rusk slabs and ready-made crackers were distinguished by increased volumetric yield, regular shape, glossy surface, fairly developed porosity structure, and characteristic taste and aroma. Rusks of this variant had relatively high swelling (19.8% higher than the control value) and reduced fragility [38].

Rusk slabs and ready-made crackers were distinguished by their higher volumetric yield, regular shape, glossy surface, fairly developed porosity structure, and characteristic taste and aroma. Rusks of these variants had a relatively high swelling (19.8% higher than the control value) and reduced [39].

It was found that increasing the dosage of PAP by more than 7% to the recipe amount of flour and EAP by more than 50% to the calculated amount of water leads to a slight darkening of the crumb of the products and a deterioration in its porosity structure, as well as to the appearance of a weak taste and smell of the powder. This allows us to assert that when using these additives in dough in quantities exceeding the recommended values, it is advisable to add prescription components that can mask these properties of the finished products [40,41,42].

It was found that increasing the dosage of PAP by more than 7% to the recipe amount of flour and EAP by more than 50% to the calculated amount of water leads to a slight darkening of the crumb of the products and a deterioration in its porosity structure, as well as to the appearance of a weak taste and smell of the powder. Rusk slabs and ready-made crackers were distinguished by increased volumetric yield, regular shape, glossy surface, fairly developed porosity structure, and characteristic taste and aroma. Rusks of this variant had relatively high swelling (19.8% higher than the control value) and reduced fragility [44,45].

The use of improvers of the Baraka -1000 series has the following technological advantages:

- Reducing the duration of the technological process.
- Reducing the consumption of dry substances during fermentation .
- improver components form a well-developed, strong gluten structure that can increase the gas-retaining properties of the dough.
- Improving the rheological properties of dough.
- Increased dimensional stability of the dough piece during fermentation, no blurring effect .
- Increased dough resistance to mechanical stress
- Increasing the activity of yeast by providing the amount of sugars necessary for life. This applies to bread with low sugar content (up to 2%).
- Increasing the water-holding capacity of the dough and increasing the yield of finished products by 410%, extending the period of preservation of bread freshness (up to 3 days), reducing the lumpyness of the crumb.
- The presence of the effect of "fermentation" of finished products, the absence of an "empty" aroma of bread.

Thus, the products were distinguished by a well-developed thin-walled porosity structure,

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intense color of the crust, golden color of the crumb, pleasant taste and aroma that lasted longer than usual. Increasing the dosage of the studied additive by more than 0.7% is not advisable due to the deterioration of indicators characterizing the quality of the finished product [46,47].

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