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Food Additive on the Basis of Milk Serum in the Production of National Varieties of Bakery Products

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ABSTRACT: Using of whey albumin in the bakery production is expanded. Whey is complex biological product consisting of water, lactose, protein, organic acid and a great deal of salts, phoyhatides, vitamins, enzymes hormones coloring and flavoring aromatic solid whey is a valuable enhancer of bread quality . Water soluble protein minerals stimulate vital activity and lactose of fermentation microflory , protein and lactose help to mace melanoids and affect ton the taste, smell and color of bread surface

I.INTRODUCTION

In the development of national bakery products, secondary raw materials were used in the production of milk curd, i.e. milk whey.

In the work, the optimal dose of milk whey was determined in the preparation of national varieties of bakery products from wheat flour of the 1st grade. The dough was prepared in a sponge way, on infusion and on liquid yeast using compressed yeast. When kneading the dough, whey was added in certain quantities to the flour mass. All technological parameters were the same as those adopted in production.

The data obtained indicate that when milk whey is added from 3 to 6%, the bread quality indicators correspond to the control. At a dose of 4-8% whey, the structure of the crumb's porosity and its physical properties are improved - it becomes softer and more delicate to the touch; the volume of rich products is increasing. Such products retain their freshness for a longer time (the crumb of the products does not lose its softness, and the crust does not lose its fragility).

Adding 9% (to the mass of flour) and more degrades the quality of the bread. It becomes small in volume, moist to the touch. Despite the fact that the crumb lightens, its compaction is observed. The color of the crust is paler in comparison with the control samples.

It is known that the disadvantage of national products is their rapid loss of freshness. This can be explained by the large specific surface area of the product and the low crumb content in the cross section. Experiments have shown that the addition of whey improves crumb quality, crust color, taste and aroma, and keeps bread fresh longer.

In many studies, it was found that the introduction of certain types of proteins into wheat dough negatively affects the quality of products. With this in mind, we have investigated two options for introducing whey into the dough when preparing the dough and when kneading the dough. Studies have shown that the introduction of whey when kneading the dough improves the quality of national products. Adding it to the dough increases the moisture and acidity of the dough, as well as finished products. Crumb of products, as well as finished products. The crumb of rich products darkens, becomes sticky and inelastic, as evidenced by the data in Table.1.

Table 1.

Quality indicators of national products with the addition of whey

Indicators	Control (Serum free)	Serum application	
		Into the dough	Into the dough
Humidity,%	38	44	38
Acidity, hail	2,8	3,4	3,0
Crumb condition	Non sticky elastic	Sticky to the touch, inelastic	Non-sticky, elastic
Crumb color	Light brown	Dark	Golden

Thus, the use of whey in the development of national products increases its biological value and deteriorates quality.



The optimal dose of whey in the production of cakes from 1-grade wheat flour is 4-8% by weight of flour. Adding it in large quantities degrades the quality of the products. With the sponge method of dough management, it is advisable to add whey when kneading the dough.

On the basis of research, we have developed a new type of national varieties of Uzbek flat cakes, high-protein butter cakes, characterized by a high content of essential amino acids. The content of whey in it is 6% by weight of flour. This saves 2 kg of flour for every 100 kg.

To improve the quality of wheat products, tea leaves are used, which contain well-coated starch. Such starch is easily saccharified and undergoes syneresis relatively slowly.

Numerous types of infusions can be summarized as follows: saccharified, unsugared, salted, fermented.

Typical ratios of flour and water in a brew are 1: 2 or 1: 3. Sugared infusions are obtained by saccharifying the brewed flour with its own amylolytic enzymes, or by adding active white malt to the infusion.

The purpose of saccharification of the leaven is to accumulate the maximum amount of sugars in it. It was believed that the addition of such a brew could correspondingly increase the sugar content of the bread. The addition of active white malt accelerates the saccharification of the brew. However, both sugared and non-sugared breads contain almost the same amount of sugars. Saccharification of tea leaves complicates the process of their preparation. Therefore, saccharification of tea leaves can be considered unnecessary in terms of increasing the sugar content in bread.

Unsweetened wheat brew is prepared for 5-10% of flour from its total amount. Immediately after brewing, the thoroughly mixed brew mass is cooled to about 35°C and used to prepare a dough or dough. The step of saccharification of the infusion, i.e. keeping the infusion for several hours at the optimum temperature for saccharification is excluded in this case.

Salty infusions differ from the usual ones in that the flour is brewed not with water, but with a salt solution heated to a boil, which is prepared using all the salt intended for a given amount of dough.

Fermented or fermented brews are obtained by fermentation after cooling with pressed or liquid yeast, lactic acid bacteria or simply ripe dough. Such fermentation could be considered not as the last phase in the brew preparation process, but as the first phase in the brewing dough preparation. When using compressed yeast for fermentation of the brew, it is recommended to add 0.8-1.0% of the total amount of flour to the dough and add it to the brew cooled to 30-32°C. It is recommended that the brewing fermentation process be carried out for 3-3.5 hours. After that, the dough is prepared in a safe way. Fermented brew in this case can be considered as a kind of "dough" or "activation phase of compressed yeast."

The use of all types of infusions improves the physical properties of the dough.

When choosing infusions to improve the quality of cakes, we proceeded from the fact that in the process of short-term baking of products, a significant part of the starch does not have time to gelatinize, which cannot affect the physicochemical properties of the crumb. The introduction of a part of the flour in the form of a brew, in which the starch is completely gelatinized, improving the properties of the crumb and the quality of the bread as a whole.

For the preparation of saccharified tea leaves, 10% of wheat flour was taken from the total amount used to prepare the dough and two times the amount of water in relation to the weight of the brewed flour. To obtain a homogeneous infusion without lumps, the flour was first mixed with about one third of the water (at a temperature of 50-80°C) intended for brewing. The remaining two-thirds of water (at a temperature of 98-99°C) was poured into this uniformly mixed mass with continuous stirring. Then the brew was cooled to a temperature of 28-30°C. During this time, the saccharification of the infusion took place.

The whey brew was prepared in the same way as the saccharified brew. The only difference is that part of the water used for the preparation of the infusion was replaced with whey.

The prepared infusions were added to the dough during kneading. The recipe and mode of preparation of infusions and dough are shown in table No. 2

Table 2

Recipe and cooking mode for dough for tortillas on various infusions (based on 500 g of flour).

Name of raw materials, semi-finished products and parameters	Unit.	Welding			Dough	Test
		Candied	Fermented	Serum		
Flour	г	50	50	50	250	200
Water	г	100	100	-	170	By calculation
Salt	г	-	-	-	-	7,5

Serum	г	-	-	-	7,5	-
Welding	г	-	-	-	-	-
Dough	г	-	-	-	-	-
Humidity	%	70	70	70	44	42
Acidity	H	-	12	3	3,0	2,8
Temperature		C	32	32	30	28
Duration of fermentation	min	-	-	-	180	40

The fermented dough was divided into pieces weighing 400 g, laid on sheets and placed in a thermostat at a temperature of 37 ° C to allow the dough pieces to stand. Proofing lasted 35-40 minutes. After proofing, the dough was molded by hand and a Chekish pattern was applied in the middle thin part of it. The preforms were laid on the bottom of the oven. Baking lasted 15 minutes at a temperature of 235-2500C. After removing the hot products from the oven, the amount of baking was determined. (1)

In 16 hours after baking, the quality of national pastry products was determined by physical and chemical indicators. Organoleptically assessed: surface, appearance, shape, state of porosity and scored on a 100 point system. From physicochemical indicators were determined: the volume of products, acidity, humidity, specific volume, as well as the amount of shrinkage.

The experiments were carried out in five repetitions on a flour sample.

Consideration of the data indicates that all types of infusions improve both organoleptic and physicochemical indicators of the quality of cakes. The amount of sugars in the infused bread is significantly higher than that of the control samples without the infusion. As a result, the crust of the prototypes was colored more intensely, and the surface of the products was even without cracks and explosions.

The infused lozenge samples had a well-loosened, more elastic and tender crumb compared to the control sample, as evidenced by the results of the scoring. The reason for the improvement in the physicochemical properties of the brewed crumb is evidently the increased ability of the dough to colloiddly bind water and the thermal effect of brewing on the protein substances of the flour. (2)

The most pronounced taste and aroma were found in cakes prepared with infusions, whey and fermented infusions. The sweet-brewed cakes had a pleasant sweetish taste. Samples of infused flat cakes received the maximum (15 points) rating for taste and aroma. The cakes prepared with the addition of infusions have a specific volume of 1.92-2.23 cm / g, which is 12-28% higher than that of the control sample.

Thus, the introduction of infusions in the preparation of tortillas improves most of the indicators, and hence the quality of the bread in general. This is evidenced by the sum of points for all organoleptically determined indicators: the prototypes of the cakes were evaluated by 89.5 points, 12.5 points more than the control samples of cakes prepared without adding infusions. It should be noted that infused cakes retain their freshness for a long time, i.e. slowly grow stale, which is an important factor in the hot climate of Bukhara.

The use of tea leaves on an industrial scale should contribute to a noticeable improvement in the quality of Uzbek butter and simple flat cakes, the most important food product of the republic's population.

Liquid yeast is usually understood as a semi-finished product prepared according to the rational scheme proposed by A.I. Ostrovsky. At the first stage, this scheme provides for the fermentation of water-based brewing at 48-54⁰C with thermophilic lactic acid bacteria, at the second stage the fermented mash with a high lactic acid content, cooled to 28-30⁰C, is used in another container as a breeding medium for reproduction in it. yeast.

To prepare the fermented mash, saccharified flour brewing (1: 4), pre-cooled to 52-54⁰C, is used. A pre-propagated pure culture of Delbrück thermophilic lactic acid bacteria is introduced into this infusion. During 12-14 hours of fermentation at a mash temperature of 48-54⁰C, Delbrück bacteria multiply in it sufficiently and at the same time a sufficient amount of lactic acid accumulates. The acidity of the mash reaches approximately 10 N. The sour mash is ready to be used as a nutrient medium for separately running liquid yeast.

For this, part of the sour mash is cooled down to 28-30⁰C by dilution with cold water, after which it is pumped into a yeast vat, where the propagated pure yeast culture is introduced into it. (3) The mash is filled with the appropriate amount of brew. In about 8 hours, a sufficient number of fermentative yeast cells accumulate in a yeast vat, periodically refilled with sour mash, and the liquid yeast is ready for use. A part (say 25%) of ready-made liquid yeast is selected for making a dough or dough. After that, a corresponding amount of sour mash is pumped into the yeast vat, cooled to 28-30⁰C.

After that, an appropriate amount of brew is fed into the fermentation tank, cooled to 52-54⁰C. After 2 hours, another selection of 25% of ready-made liquid yeast is introduced with the corresponding filling of the yeast vat with chilled sour mash, and the mash vat with tea leaves.

Ready liquid yeast has a moisture content of 86-88%, titratable acidity from 10 to 12 N and a lifting force (as the dough ball floats up) from 15 to 25 minutes.

The use of whey instead of water in the preparation of liquid yeast improves the vital functions of the fermenting microflora as a result of the assimilation of protein substances and microelements of whey by yeast and bacteria. Therefore, liquid yeast with a humidity of 87-88% and an acidity of 11-12 N had a stable lifting force for 15-20 minutes. The dough was prepared using ordinary liquid yeast (control) and liquid yeast using whey (experimental sample) according to the recipe for Obi-Non cakes in a non-steam way.

Table 3

Comparison of quality indicators of "Obi-Non" prepared with conventional liquid yeast and liquid yeast with whey.

Indicators of the quality of cakes	unit of measurement	Control (on ordinary liquid yeast)	With liquid yeast and whey
Upek	%	11,1	10,8
Shrinkage	%	4,0	3,9
Humidity	%	38,5	38,7
Acidity	H	3,1	3,2
Specific volume	Cm / g	1,63	1,8
Point score	score	73,0	81,0

The sensory score data are shown in Table 3.

Table 4

The results of the scoring of the quality of "Obi-Non" cakes prepared with liquid yeast and whey

Indicators of the quality of cakes	Control (on ordinary liquid yeast)	With liquid yeast and whey
The form	12,0	12,0
Peel color	10,0	10,0
Surface	10,5	12,0
Crumb condition	12,0	13,5
Porosity	6,0	8,0
Scent	10,5	12,0
Taste	12,0	13,5
Total points	73,0	81,0

From the data of tables 3 and 4 it can be seen that the quality of the cakes prepared with liquid yeast on whey in terms of the physicochemical properties of the crumb, porosity, taste and aroma is significantly better compared to the control sample. The specific volume of the test sample of cakes is 14% higher than the control. This improvement in the quality of the cakes is evidently due to the better fermentation activity of the yeast cells. The presence of an additional amount of sugar - lactose, improves the color of the bread crust, and the formed by-products during the melanoidin formation reaction help to improve the aroma and taste of the cakes. The presence of lactic acid in liquid yeast promotes better protein swelling and, accordingly, improves the physicochemical properties of the crumb.

Thus, the results of the study showed that the use of whey in the preparation of liquid yeast improves their fermentation activity, and also contributes to the production of good quality cakes.

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