

Ministry of education and science of the Russian Federation Federal STATE
Autonomous educational institution « South Ural state University» (NRU)
Faculty «Higher medical and biological school»
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Development of production technology and formulation of bread with extended shelf life



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The problem and its solution



Ways to improve the preservation of bread:

1. With a decrease in the humidity of the product to 16% drying can be suspended.
2. With the increase in the amount of gluten in flour increases the ability of bread to maintain freshness.
3. Adding to the dough products that increase the hydrophilic properties of the crumb.
4. Selection of the optimal baking mode and the use of rational storage mode. Freezing.
5. Application of hydrodynamic methods of water treatment.

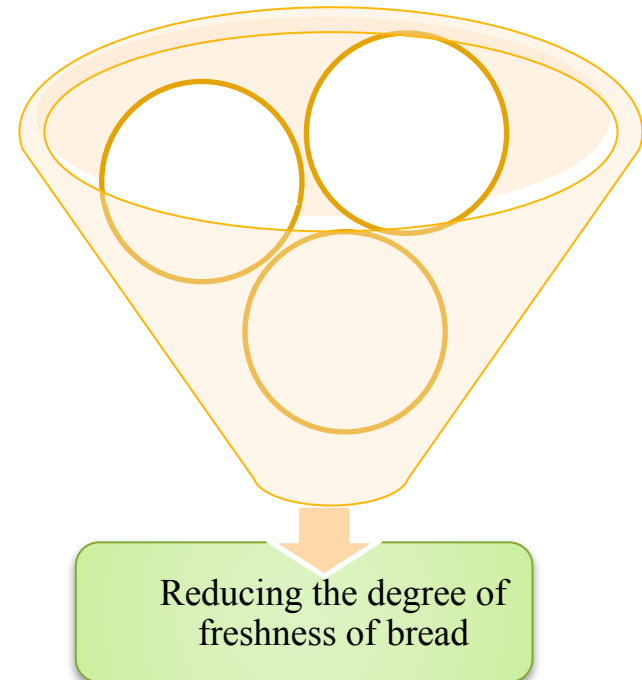
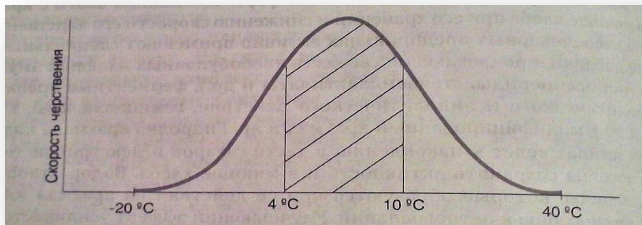


Figure 1 – Reasons for reducing the degree of freshness of bread

Bread recipe with extended shelf life



As objects of research were developed the following samples of bread: bread control (obtained on the basis of water for technical purposes (tap), bread obtained on the basis of cavitated water using ultrasonic apparatus series «Volna» model UTA-0,4/22-OM.

Table 1 – the Formulation of bread from wheat flour of 1 grade

Ingredient name	weight, g
1. Flour	465
2. Yeast, pressed	7,5
3. Salt	6,5
4. Activated water	380
Conclusion:	859



The acoustic source of elastic fluctuations of ultrasonic device "Volna" model UTA-0,4/22-OM



Ultrasound



Activated water

Technological scheme of production of bread with extended shelf life

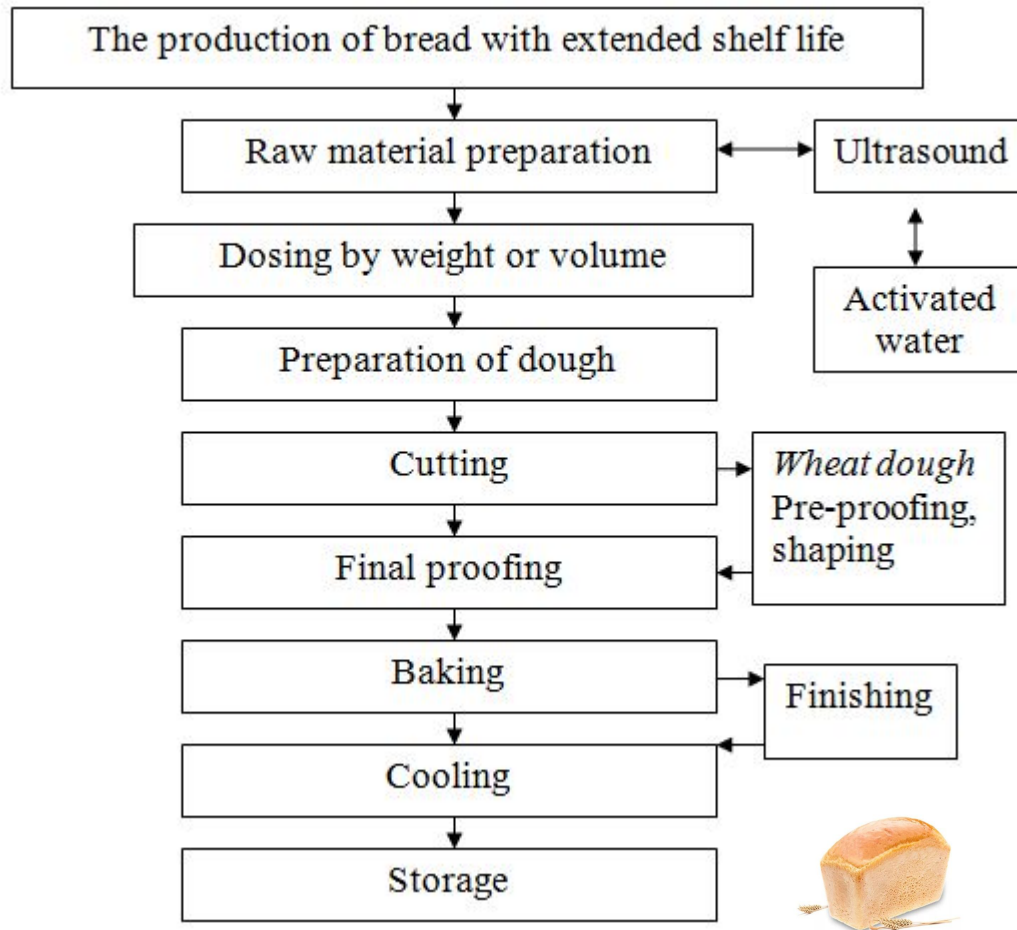


Figure 2 – main stages and operations of bread production with extended shelf life

The effect of activated water on the quality and preservation of wheat bread

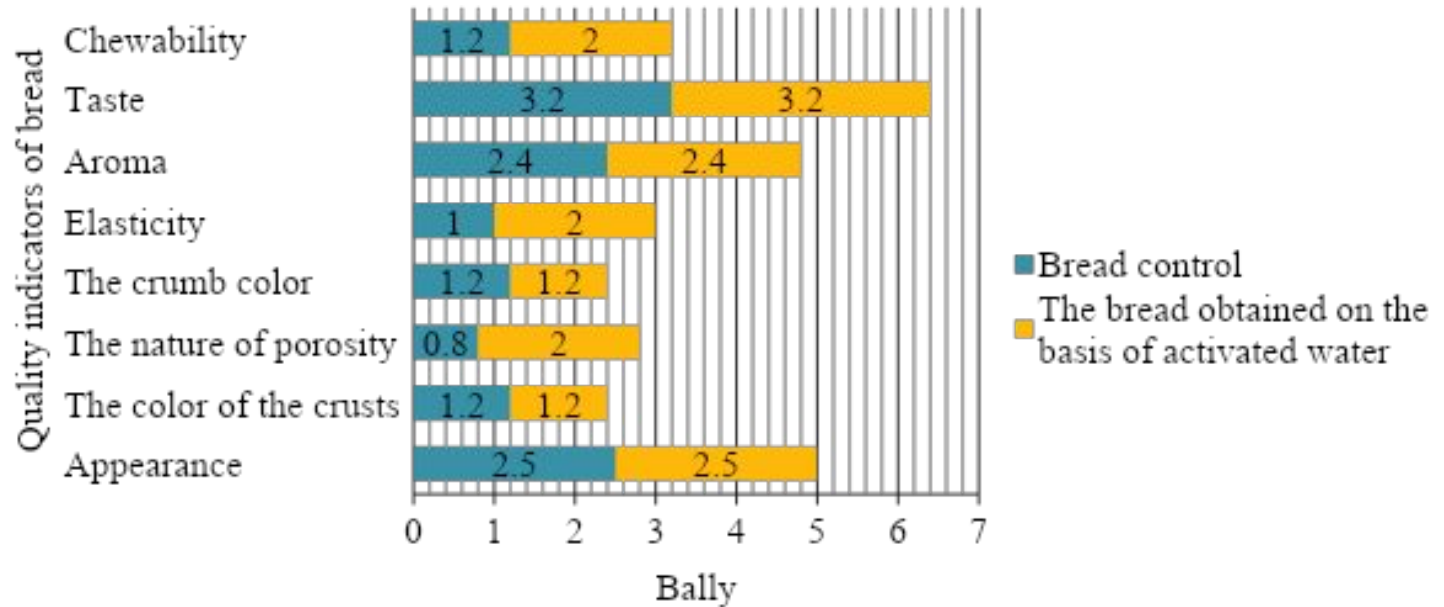


Figure 3 – Results of the tasting assessment taking into account the weighting factors



Table 2 – Characteristics of physical and chemical parameters during storage of bread

Name of indicator	Norm according to ГОСТ 27842-88	12 hours storage	48 hours storage	72 hours storage
Bread control				
The humidity of the crumb, %	not more than 45,0	39,79	38,11	38,02
The acidity of the crumb, grad	not more than 3,0	2,9	2,9	2,9
Porosity of crumb, %	not less than 68.0	65,12	65,18	65,10
The bread obtained on the basis of activated water				
The humidity of the crumb, %	not more than 45,0	41,12	36,83	36,51
The acidity of the crumb, grad	not more than 3,0	3,1	3	3
Porosity of crumb, %	not less than 68.0	66,91	67,04	66,8



Photos of the studied samples of wheat bread:



Figure 4 – Bread control



Figure 5 – Bread, obtained on the basis of activated water



Results of the research

- ✓ Based on the obtained data of the study of organoleptic and physico-chemical evaluation of wheat bread with the use of cavitated water during storage, it was found that the use of ultrasound has a positive effect on the consumer dignity of bread, but also contributes to the prolongation of its storage.
- ✓ The use of activated water helps to accelerate the maturation of the dough and increase fermentation. As a result, bread is obtained with high consumer advantages.
- ✓ Activated water helps to slow down the development of potato disease, which indicates an increase in the microbiological frequency of bread.
- ✓ When using activated water, you can slow down the processes of hardening and drying occurring in the bread.



Thank you for your attention!!!

