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The Research of the Microbiological Stability During Storage of Bread Affected by Potato Disease

Raushangul Ulangaziyevna Uazhanova

Almaty Technological University, Tole bi Street, 100, 050012, Almaty, Kazakhstan

Abstract: This article describes a research of the microbiological stability of bread during storage affected with potato disease. Conducted researches to determine the overall level of insemination of the flour spores of bacteria, in addition insemination of bread's potato disease. Considered the problems of microbiological stability during storage.

Key words: Flour Insemination Disputes of Bacteria · Contamination of Bread · Potato Illness · Bread · Storage · Microbiological Stability

INTRODUCTION

Human health is largely determined by the quality of the products they consume. The concept of quality of food includes not only their nutritional value, organoleptic properties, but also the microbiological safety [1, 2]. Obtaining and maintaining safe food-one of the main factors that determine the health of the nation, as the organisms are not only initiate food poisoning, but also produce highly toxic substances, in particular micro toxins, mutagenic and carcinogenic [2, 3].

In modern conditions of production of bakery products in packaged form with extended shelf-life is one of the main directions of development of the baking industry in Kazakhstan, which is caused by the need to improve the food safety of products, supplying the population of ecological trouble areas, remote regions, in terms of man-made disasters, crisis and emergency situations [4, 5]. Urgent problem bakery products with long shelf-life is to increase their microbiological storage stability-preventing growth of molds [6, 7].

The purpose of these research is to study the influence of contamination of the main raw material-flour bacterial spores on the process of growth of molds bakery products and establishing the maximum permissible level of contamination for the production of bakery products in packaged form. The work was conducted at the Research Institute "Food security" ATB, JSC "Kazakh Academy of Nutrition," Department "Safety and quality of food" ATB at bakeries Almaty and Almaty region [5].

In the research were used the following materials: wheat flour Kazakhstan, yeast, salt, sugar, margarine table, sunflower oil, potable water, sorbic acid. In conducting research using the following cultures of microorganisms: Bacillus subtilis, Aspergillus niger.

Microbiological stability-is the product's ability to resist the damaging action of microorganisms and maintain their consumer properties within a certain time. Microbiological stability problem of bread includes issues preventing its microbiological spoilage-molding and potato disease [8, 9].

Development of the potato bread disease usually excludes its musty as bread, potato sticks infected with spores [10], retains its consumer properties only within 2-3 days after baking and the process of growth of molds most intensely manifested at 4-5 days. Due to the fact that research is devoted to microbiological stability during storage of bread and bread storage, potato disease affected not appropriate evaluation criterion microbiological stability during storage of bread was the process selected musty .

Storage of unpackaged bread also is not advisable, however, in communicating all experiments of this study bread kept sealed in sterile (to avoid further infection)

Corresponding Author: Raushangul Ulangaziyevna Uazhanova, Almaty Technological University, Tole bi Street, 100, 050012, Almaty, Kazakhstan.

polypropylene bags. Today in our country produces two kinds of bread in packaging: bread long storage-shelf life of more than 20 days and bread with a longer shelf life- the shelf life of less than 20 days.

Bread long storage-is usually a special purpose (for astronauts, divers, etc.). Usually it is done using special additives that slow the staling and microbial spoilage in packaging of a certain quality, using the means of conservation (sterilization), the statutory documentation applies only to this type of product . Microorganisms composition, reproduction which may cause deterioration of bakery products is diverse and includes two groups of microorganisms-to grow on bread and its crumb. Due to the fact that the baking temperature is high enough (250-280 °C at the surface and 90-95 °C in the center of the product), at the furnace exit surface substantially sterile bread and bread crumb in a viable state to remain only bacterial spores. A source of contamination of bakery products of bacteria spores is usually feedstock mainly flour. Infection surface finished products by fungi can occur only from the outside. Therefore, an important decision was made to investigate the microbiological status of flour.

Conducted studies to determine the overall level of contamination of flour bacterial spores, as well as contamination of potato bread from her illness. The results of the study are presented in Table 1.

At the second stage of the selection activity previously identified strains of bacteria tested by the test laboratory baking. In kneading dough with a spore suspension of bacteria were added at 105 CFU / g of flour. The results are shown in

Due to the fact that in experiments to establish the relationship between the degree of contamination of the flour with spores and bacteria-resistant microbial strains are bread using bacteria differ in their biochemical characteristics typical of the microorganisms of flour, to confirm the established dependencies conducted additional experiments. Investigated the microbiological stability of the bread flour with baking properties identical, but different degrees of contamination of bacterial spores (Table 3).

Conducted research of influence of an obsemenennost of the main raw materials-a flour disputes of bacteria on process of molding of bakery products and establishment of maximum permissible level of an obsemenennost for production of bakery products in packed form.

Table 1: The relationship between the number of bacterial spores in the flour and potato bread disease

		% Of samples of flour, potato sticks infected with seeding ??level, CFU / g	
wheat Flour	Number of samples	<105	>105
Extra grade	72	31,8	100
First grade	98	36,2	100
Second grade	110	31,0	97,5
Extra grade	225	33,4	99,0

Table 2: The severity of the disease potato bread contaminated with bacterial spores

		Signs of potato disease		
Species of bacteria	Strain	24h	36h	Degree of damage to the potato disease
Sublilis	0611-a	-		absent
Subtilis	36-1	-		absent
Sublilis	4/8	-	-	absent
Sublilis	744-5	-		absent
Sublilis	3*	-		average
Cereus	96-2			absent
Cereus	45			absent

Table 3: Baking properties of flour with varying degrees of dissemination

Contamination of flour bacterial spores,CFU /g	Gluten content,%	Ndef™ appliance unit	Humidity,%	Acidity, hail
50	31,0	68	13,5	2,5
150	29,5	70	14,0	2,5
420	28,7	65	13.8	2,5

Based on the analysis of the data revealed that: Level of contamination of bacterial spores flour to make bread with extended shelf-life - no more than 101 CFU / g

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