

INVESTIGATION OF QUALITATIVE INDICATORS OF A FUNCTIONAL CREAMY VEGETABLE SPREAD DURING STORAGE

Zhanat Tuyakbayeva^{1*}, Nazym Alzhaxina¹, Zhansaya Zhadrassyn¹,
Magzhan Matai¹, Nurzhan Muslimov¹

¹Astana Branch of Kazakh Research Institute of Processing and Food Industry LLP,
Al-Farabi 47, 010000 Nur-Sultan, Republic of Kazakhstan

*e-mail: zhanat_tuyakbaeva@mail.ru

Abstract

The main processes that reduce the nutritional value of spreads are oxidation, hydrolysis of the fatty phase and acidity increase. The purpose of the study is to determine the quality indicators of the developed creamy-vegetable spread, balanced in terms of the fatty acid composition of omega-3 and omega-6 acids.

The creamy vegetable spread “w-balance” was developed on the basis of the Astana branch of the Kazakh Research Institute of Processing and Food Industry within the framework of the project “Development of technology for functional spreads from vegetable raw materials”. The materials for the spread were butter, vegetable oils (linseed and rapeseed), skimmed milk powder, vitamins A and E, salt, water, and emulsifier. The dynamics of accumulation of oxidation products (peroxides and hydroperoxides - using the titrimetric method for determining free fatty acids in vegetable oils) was observed at temperatures of 4 ± 2 °C, -10 ± 2 °C, and -23 ± 2 °C during storage. The establishment of the terms and conditions of food storage was carried out in accordance with the hygienic requirements of food safety. Organoleptic indicators were studied depending on the shelf life. Organoleptic quality indicators of creamy vegetable spreads during their storage were evaluated in accordance with GOST 32189. The results of the evaluation of organoleptic indicators in points were summed up for each indicator, as a result, 19 points were obtained due to a small specific smell of linseed oil.

During the first twenty days, the peroxide number for all three samples did not exceed 3.5, but during 30 - 60 days of storage in samples at a temperature of 4 ± 2 °C and -10 ± 2 °C, the peroxide number increased sharply and amounted to 5.2 and 5.5, respectively. While the indicator at a temperature of -23 ± 2 °C was only 3.6. After 90 days of storage, the peroxide number increased in all samples, the maximum number was reached in the sample at 4 ± 2 °C, and the minimum increase was shown by the sample at -20 degrees and was 3.9. The results of the study showed high resistance to oxidation, preservation of organoleptic and structural-rheological properties in 90 and 180 days at temperatures of 4 ± 2 °C, -10 ± 2 °C and -23 ± 2 °C. The acidity of the spread during storage changed slightly, at 4 ± 2 °C and -10 ± 2 , the acid number increased from 2 to 2.4 maximum. While at -23 ± 2 °C it reached only 2.19. These data indicate that the storage temperature affects the shelf life.

This work is relevant and requires further research. To establish the exact expiration date, it is necessary to examine the product for the presence of microbiological indicators, such as yeast and mold.

Key words: Creamy-vegetable spread, Oxidation, Peroxide value, Acid value, Acidity, Shelf life.