

Heat Resistance Determination of Butter Paste with Red Beet Powder

O. Podkovko

J. Smirnova

T. Rashevskaya

National University of Food Technologies

Abstract

In recent years, public health has deteriorated greatly in Ukraine. Cardiovascular diseases, cancer and diabetes are becoming wide-spread. According to estimates of the World Health Organisation experts, more than 70% of your health relies on what you eat. Food should provide body with the necessary range of nutrients, which facilitate the prevention of disease. At the same time food should be varied, tasty, safe and correspond to national habits and traditions. Thus, the development of food products with prophylactic properties is very promising. These foodstuffs can be produced by adding natural additives to traditional foods. This is why we have developed butter paste with red beet powder. Functional properties and the harmonious blend of flavors served as the criteria for the choice of additives. We also added a mixture of flaxseeds and inulin to the milky base of the paste. Flaxseeds are a source of the polyunsaturated fatty acids omega-3 and omega-6. The absence or lack of these fatty-acids inhibits children's growth, reduces the effectiveness of the reproductive system and has a negative effect on thrombosis [1]. Inulin is recommended to help treat the following diseases: coronary heart disease, diabetes, obesity, atherosclerosis, cancer, osteochondrosis, infectious diseases and stress [2,3].

One of the qualitative indicators of butter paste is heat resistance. Heat resistance is based on the ability of butter paste to keep its form at higher temperatures – not to flow under its own weight. Heat resistance is good if the deformation factor ranges from 1.0 to 0.86, satisfactory – from 0.85 to 0.70, unsatisfactory <0.70.

Materials and methods

The object of the research was represented by model samples of the butter paste with red beet powder created at the department of milk and dairy products of the NUFT. Control sample was the butter.

From the model sample of the butter paste we cut out a piece of about 100 g, cooled to temperatures below zero and kept during the day to complete crystallization of fat. From prepared model samples of the butter paste cylinders were cut out (with 20 mm height and diameter of 20 mm), carefully placing them on a glass plate at the distance of 2 – 3 cm with the numbers of samples. The plate with samples was placed in the thermostat at the temperature of 30 °C and was kept during 2 h. After that, model samples were carefully removed from the thermostat, placed on

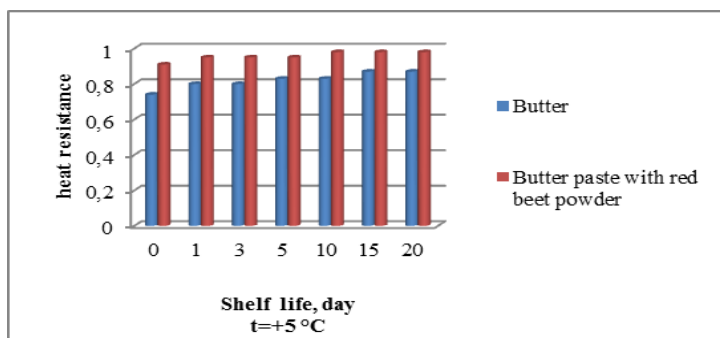
the graph paper and measured the diameter of each cylinder. Heat resistance indicators were calculated according to the formula:

$$K_M = \frac{D_0}{D_1}$$

where D_0 and D_1 – a cylinder basis before and after thermostating [4].

The data of the heat resistance indicator that are close to one, characterized high heat resistance, and below one – low.

Results



According to the histogram butter paste with red beet powder compared with butter has better heat resistance. You can also see that after the 5th day of storage the heat resistance begins to take constant value.

Conclusions

Thus, the produced model samples are characterized by structure formation. The adding of dietary plant additives improves the structure formation, increases the heat resistance, and hence, the quality of the butter paste.

References

1. Tanya L. Blasbalg. Changes in consumption of omega-3 and omega-6 fatty acids in the United States during the 20th century // Tanya L. Blasbalg, Joseph R Hibbeln, Christopher E Ramsden, Sharon F Majchrzac, Robert R Rawlings // Am J Clin Nutr. – 2011. - №93. – P. 950 – 962.
2. Thomas Barclay. Inulin – a versatile polysaccharide with multiple pharmaceutical and food chemical uses / Thomas Barclay, Milena Ginik-Markovic, Peter Cooper, Nickolai Petrovsky // J.Excipients and Food Chem. – 2010. - №1(3). – P. 27 – 50.
3. Rashevskaya T. Electromicroscopic Investigations of the structure of Butter with Inulin // T. Rashevskaya // International workshop Inulin as medicine and Food Ingredient, 30 May 1997:abstracts – Kiev: USUFT, 1997. – P.23.
4. Гуляев-Зайцев С.С. Физико-химические основы производства масла из высокожирных сливок / С.С. Гуляев-Зайцев. – М.: «Пищевая промышленность». 1974. – 135 с.