природні барвники - Е100 куркумін та спіруліна. А у синтетичних - Тартразин Е102 і Синій блискучий Е133.

Тому, вибір між натуральними і синтетичними барвниками залежить лише від конкретних вимог щодо продукту, таких як безпека, естетичність та економічність, а також від вимог і вподобань споживачів.

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APPLICATION OF MICROBIOLOGICAL CAROTENE IN FOOD PRODUCTS

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As it is known, Carotene is one of the most important A-vitamin's precursors-provitamins in the organism. Theoretically one

molecule of β-carotene turns into 2 molecules of vitamin A. Though it was adjusted during experiments in vivo, that β-carotene only partially turns into vitamin A in the organism and the rest remains immutable. And what is more, percentage of β-carotene turning into vitamin is controlled by vitamin's A status in the organism thus it cannot lead to toxic response in the human organism. Cogent evidence was obtained as a result of experiments, that β-carotene appears to be not only source of vitamin A but also plays important independent biological role. β-carotene protects macromolecules and biomembranes of cells from damage and thereby increases the body's resistance to free radicals and various pathogenic viruses. [3–5].

Short terms of carotene's conservation in the foodstuffs based on sunflower seed oil raw, e.g. halvah, are conditioned by the processes of biological oxidation as well as lipid's interaction with oxygen and formation of peroxide radicals. Preservation of physical and chemical parameters of carotene's biological activity in the lipid containing foodstuffs in the process of the long shelf life can be reached through proved choice of the antioxidants as well as through choice of the lipid containing product in the capacity of carotene's carrier.

It is well known that the efficient application of antioxidants is impossible without information on antioxidant activity, whether about separately taken stabilizers of oxidative process or a mixture of two or more antioxidants, as well as their interactions in one product Antioxidants in the mixture under initiation with lipid containing products may exhibit additive abilities as well as synergetic and antagonistic depending on quantitative proportion and presence of concomitant components [1, 2].

Foodstuffs received on the basis of sunflower seed paste have the same disadvantages that many lipid containing products produced using seed oils containing carotene, namely extreme instability regarding oxidative destruction. Unfortunately, range of antioxidants permitted for use in foodstuffs is limited because of high requirements established for them. The values of peroxide and acid numbers (PN and AN), reflecting the biochemical processes occurring during the preparation and storage of halva, can be considered as quality parameters of the specified product.

Crops with the highest mass fraction of oleic and linoleic acids, microbiological carotene, namely, oil sunflower (*Helianthus annuus*) and walnuts, were chosen for this study as raw materials for creating halvah with a balanced fatty acid composition. Biologically active antioxidants of tocopherol isomer scale (Mixed Tocopherols, Tocomix) in different dozes and proportions for stabilization of microbiological carotene in sunflower seeds halvah were tested in this study. Microbiological carotene was introduced into sunflower seed paste and walnut paste. Oxidative destruction of the products with carotene under conservation at different temperature conditions (37^{o}C and 60^{o}C) was predetermined by changes of acid (AN) and peroxide numbers (PN) and also their fatty acid composition. Fatty acid composition was determined by means of high effective liquid chromatography. Chromatography was carried out on the Shimadzu GC-14B Gas Chromatograph equipped with auto injector AOC-14 and integrator C-R7a.

During the study of the process of oxidative destruction of halvah from sunflower seeds, it was revealed that data obtained within 24-28 hours make it possible to judge the speed and intensity of the oxidative process in sunflower sub-protein paste, which makes it possible to select antioxidants within a short period of time.

Comparative analysis of the fatty acid substance in the paste of different vegetable origin exhibited dominance of the polyunsaturated fatty acids C18:1 and C18:2 in the sunflower seed paste and what is more C18:3 in the walnut paste. Physical and chemical changes of the pastes of sunflower seed and walnut origin were different within the oxidative process regarding AN and PN indices.

It has been found that the AN and PN parameters were steadily increasing for a short time for the oxidation of sunflower seed paste, while the same parameters were quite stable over a long period of oxidation at temperature of 37.6^{o}C, namely, for 7-14 days and possibly more, for the walnut paste. No further study of oxidative degradation was carried out, since there was no need to prolong this process. Regardless of very low values of peroxide numbers within the whole period of oxidation, the halvah ready product made of walnut raw partially lost taste (savour) abilities during time of conservation given T-22^{o}C over 6 months. It can reveal appearance of processes of

quality deterioration not connected to the peroxidation. Wherein the quantitative characteristics of carotene remained within the limits of initial values.

It is necessary to emphasize that values of Peroxide numbers in the walnut paste differed highly from the same parameters in the sunflower seed paste. The initial values of Acid numbers in the both products were almost similar to each other. Oxidation of pastes with carotene added at the high temperature (60°C) during 24 hours did not produced in the change of the oxidative dynamics.

It has been found that oxidation processes in the sunflower seed and walnut pastes with carotene added proceeded according to different dynamics. Walnut paste had very low initial values of Peroxide number, which made this product more attractive for adding carotene into it. This deduction was proved by the data on oxidation of this paste with carotene added at high temperatures. Peroxide number increased lightly for walnut paste in comparison with sunflower seed paste with no violation of quality standards (PN=0.01). Wherein PN of sunflower seed paste were highly increasing and did not corresponded to the values of the commodity till the end of oxidation.

Addition of the antioxidant to the walnut paste did not change the terms of carotene oxidation and remained stable for sufficiently long period of time which was comparable with the oil preservation itself. Thus, carotene showed good preservation in the walnut paste, which might be due to the extremely low content of peroxide in it. At the same time, the addition of Tocomix to the sunflower paste turned out to be effective, which produced in a decrease of the peroxide accumulation level and an increase of the product shelf life by 2 times.

Thus, the study carried out has been shown that walnut paste was a more acceptable basis for the addition of biologically active microbiological carotene in order to create new food products with medicinal and preventive properties and a shelf life that met the international standards.

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SYNTHETIC USAGE OF FUNCTIONALIZED ARYLTHIOCYANATOAMIDES CONTAINING AN ACETYLPHENYL FRAGMENT

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The number of aromatic diazo compounds investigated in anionarylation reactions, was recently significantly expanded due to the introduction of aniline derivatives with electron-donating and electron-withdrawing substituents and bisdiazonium salts based on diamines of benzidine and phenylene series [1].

As a continuation of our research, we investigated 4-acetylphenyldiazonium salts in Meerwein and anionarylation reactions. In particular, we obtained bromo- **1** and thiocyanatoarylation **2** products of acrylic and methacrylic acids amides, which contain an acetophenone fragment, and carried out their bromination and cyclization. Based on bromamides **1**, azido-, N,N-diethyldithiocarbamato-, and O-alkyldithiocarbonatoamides **3-5** were synthesized, which are practically impossible to obtain in conditions