ADVANTAGES AND DISADVANTAGES OF SYNTHETIC FOOD COLORINGS

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Annotation. This scientific research explores the use of synthetic food colorings, highlighting both their benefits and potential drawbacks. Synthetic colorings are widely employed in the food industry to enhance visual appeal, improve product consistency, and increase consumer acceptance. The paper discusses the advantages, such as improved shelf-life, uniform coloration, and cost-effectiveness, alongside the disadvantages, including potential health risks, allergic reactions, and negative consumer perception. The study aims to provide a balanced overview for food scientists, nutritionists, and consumers regarding the safety, efficacy, and regulatory considerations of synthetic food colorings.

Introduction. In the coming years, the food industry will inevitably face the fact of the need to replace synthetic dyes with natural, harmless to humans. The list of allowable synthetic dyes is shrinking every year.

Synthetic and natural coloring agents are used for painting food products. Recently, there has been a trend towards the organic use of synthetic dyes for food purposes, so the problem of researching and studying the production of natural dyes is an important issue today. When choosing cheese, one should take into account its availability, the content and properties of the dye, as well as the fact that natural dyes should enrich food products with biologically active compounds, in particular vitamins /1/.The appearance and color of food, pharmaceutical, perfumery and cosmetic products and some other industries determine the consumer properties and range of products.

The Republic of Uzbekistan is a country with a huge potential for renewable raw materials. Taking into account the huge raw material potential, as well as the annually increasing demand of the population for functional food products, the development of universal technologies for the production of natural dye. At the same time, there are a number of unconventional raw materials bases for obtaining the dye.

The problem of food coloring is especially relevant, where color, together with taste properties, is one of the indicators of the quality of food products, besides unnatural coloring negatively affects appetite and digestion.

The flora of Uzbekistan is rich in dye plants, characterized by a significant content of various coloring substances and valuable physiological active compounds.

In this regard, some work has been carried out to identify new sources of obtaining food dyes of plant origin, to study the chemical composition of anthocyanins and to develop a method for obtaining natural food dyes used for coloring various food products.

One of the promising red table beet we have received a dye concentrate and studied the physical-chemical properties of food dyes.

Beet dyes are raw materials for the production of natural food coloring used for tinting confectionery, dry jelly, soft drinks, etc.

Red beetroot is characterized by a rich chemical composition. It contains the following substances; 82.2 water, carbohydrates 14.4, fat 0.6, fiber 0.7. In 100 g of the edible part of beets there are water 86.5, proteins 1.7, carbohydrates 19.8, (of which 10.8 total carbohydrates and 9.0 mono- and disaccharides, fiber 0.9, organic acids). Beet minerals are provided (in mg per 100 g of the edible part, sodium 86, potassium 288, calcium 37, magnesium 43, phosphorus 43, iron 1.4,).

Vitamins per 100g of products in mg: Vitamin A-0.002, B1-0.02.B2-0.04,B3-0.4, B5-0.1,B6-0.07,B9-0.013,Vitamins-10 and vitamin E-0.1

The purpose of our work is to obtain a natural dye from red beets for food production.

To obtain the dye concentrate, 2 kg of beets after cooking for 1.5 – 2 hours were passed through a meat grinder, squeezed out, and passed through a filter. 700 ml of natural juice were obtained from 2 kg of red beetroot.

After obtaining the juice from the raw material waste, the dye concentrate is obtained three times by extracting acidified water at 18-20°C. The extracts are combined, evaporated by a rotary evaporator at 40-45°C.

The resulting concentrate of dyes is a liquid of sour taste, with an aromatic odor, from red to dark red, the content of coloring substances is 30 g / l, dry matter is 45%, the relative density is 1.20 g / l. The total composition includes betacyan glycosides. Betacyanins absorb in the visible region at 535-545 nm, but differ from anthocyanins by low absorption at 250-300 nm. / 2 /.

To do this, 10 ml taken from the beet dye concentrate are transferred to a 500ml volumetric flask and brought to the label with distilled water extractant (Y). 10 ml (Y_1) of the extract from the solution is placed in a 50ml volumetric flask and the volume of the solution (Y_2) is brought to the label with a 2% solution of citric acid. 2 ml taken from the resulting solution is placed in a pycnometer with a capacity of 10 ml and the volume is brought to the mark with ethyl alcohol containing 1% hydrochloric acid. The optical density of the resulting solution is measured on a photoelectrocolorimeter PEC-56 using a green light filter (№6) and cuvettes with a

$$X = \frac{a \cdot Y_2}{b \cdot Y_1 \cdot Y_3}$$

layer thickness of 1 cm. As a control solution, a 5% solution of cobalt sulfate with a water molecule is used. Based on the obtained optical density and calibration graph constructed for a standard sample of anthocyanin glycosides, finding the content of dyes (X) (as a percentage of the absolutely dry weight of raw materials) according to the formula:where: a- the amount of dye in 10 ml of the solution, found according to the kolibrovochny schedule, in grams; Y-the total volume of the extract, b-the weight of the raw material, in grams,Y_1- the amount of extract taken from the total volume for dilution, in milliliters;Y_2-the volume of the solution after dilution Y_1, in milliliters; Y_3-the volume solution taken from solution Y_2 and brought to 10 ml.

Beetroot dye can be recommended for coloring dairy products (kefir, yogurt), butter creams, and other foods with an acidity not higher than 7.0 pH. Especially in the future, this dye is for the production of ice cream. International Dye Index E162. Beetroot juice has long been used to tint many fruit and berry products (beverages, confectionery, dry jelly). /4,5/.

REFERENCES

1. Rakhimkhanov Z.B., Mukhamedova F,H.,Karimdzhanova.K, Ismailov A.I. "Methods of control of production of natural food dyes, Tashkent, Uzbek chemical.zh.5,1983.
2. T.P.Fedorova, I.P..Persianova, I.N.Fedorova, N.K.Kovalenko, D.P.Kachalai. A drink from table beetroot. Food industry, No. 7, 1993. c13-14
3. Tipsina N.N., Tsuglenok N.V. Scientific foundations of confectionery technologies with the use of vegetable raw materials Bulletin. Krasus GAU.-Krasnoyarsk, 2005.-No.8.-c283-288
4. Bolotov V.M., Cherepnin B.C., Polukhin H.A., Chernyshova S.N. Modified natural food dyes from vegetable raw materials // Tez. dokl. International conf. "Scientific and technological progress in the processing industries of the agro-industrial complex". M., 1995. -p.43.
5. Kasumov M.A., Musaev V.R., Amirov V.A. Food dyes from vegetable raw materials // Food. prom-st (Moscow). 1990. - No. 6. - pp.48-49.