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THE RESEARCH OF THE FEASIBILITY OF BEETS FOR THE MANUFACTURE OF PECTIN-CONTAINING EXTRACT FOR THE FOOD INDUSTRY

This article describes the results of the determination of physicochemical parameters (soluble solids, titrated acids, pH, total sugar and pectin) of table beet "Bordo", obtained from the Kainar village of Almaty region.

To determine the physico-chemical parameters of beet (soluble solids, titratable acid pH, total sugar and pectin), the analysis of the liquid phase, raw and dry pods of beetroot, physico-chemical indicators. The research was conducted using the following methods: soluble dry substances were determined according to GOST R51433 - 99, GOST 28562 - 90, titrated acids GOST 51434 - 99, GOST25555.0 - 82 pH of the medium GOST 26188 - 84, total sugar GOST 8756.13 - 87 and pectin GOST 29059 - 91.

Keywords: pectin, beetroot, acid, varieties, sugar, vegetable, vitamin

Introduction

In modern conditions, the deep processing of vegetables with the preservation of valuable biologically active compounds is very relevant. The Republic of Kazakhstan has significant production and climatic potential for the production of vegetables, including beets. This is facilitated by the fact that vegetables, in particular, beets, have long been known to humanity as highly necessary products. [1].

If more details stop on beetroot this is one of the most common vegetable fodder and industrial crops. Beetroot (*Beta vulgaris* L.) is a biennial (much less often one- and perennial) herbaceous plant of the amaranth family (until recently, it belonged to the family of crows). In the first year forms a juicy root, usually dark burgundy (brown) color. In the second year of life, beets "go into the trunk", blooms and gives seeds. There are wild and cultivated beet varieties. Cultivated beets are divided into table and fodder varieties. Root crops of beetroot, along with other vital substances, contain significant amounts of pectin substances (1.1g per 100g). Beets are rich in nitrogenous substances, among which proteins occupy the main place. It surpasses many vegetables in the content of essential amino acids (valine, leucine, isoleucine, lysine and some others) [2, 3]. Beetroot is widely used in folk medicine to improve the functioning of the gastrointestinal tract, pancreas liver, high blood pressure, for the prevention and treatment of atherosclerosis, to increase physical and mental performance, for the prevention of cardiovascular, infectious diseases.

Many researchers rightly recommend that patients introduce regular intake of red table beet or beet juice into the diet. Beets are widely used in cooking: vinaigrette, beetroot soup, Ukrainian borsch. I would like to draw attention to the fact that in beets and in its juice, there are all the necessary trace elements to support the body's active life: potassium, calcium, cobalt, copper, magnesium, manganese, iodine, sulfur, etc. Especially important cobalt, without which the body is formed vitamin B 12 - main circulatory stimulant. The presence of iodine reduces the incidence of thyroid cancer in humans. Beets and beetroot juice are good for people who are predisposed to be "full".

The given the above, the use of these products in the daily diet of people is very vital. The relevance of this work lies in the fact that vegetables, including beets, after growing at the stage of their storage, up to 30% or more are lost. One of the reasons is that an effective technology for processing these vegetables in Kazakhstan has not yet been established. One of the aspects of improving their quality indicators and the degree of increasing their profitability is the more in-depth improvement of their technological processes of processing with the inclusion of advanced technologies that improve their properties.

It has known that products (juices and drinks) of beet almost does not contain such a valuable product, such as pectin, although they contained large quantities. The pectin protects the body from the effects of radioactive and heavy metals, delays the development of harmful microorganisms in the intestines, helps to remove cholesterol. In addition, its presence in products is necessary for the stable preservation of the complex of vital vitamin and microelements, as well as for their full assimilation by the body. Consequently, it is very important to develop an effective technology for the extraction of pectin from vegetables and to enrich the resulting products. According to literature data, it is established that in the process of beverage production, it does not dissolve, it goes almost completely into squeezing vegetables [4].

This article describes the results of the determination of physico-chemical parameters (soluble solids, treatable acids, pH, total sugar and pectin) of Bordeaux beetroot obtained from the village of Kaynar, Almaty Region.

The determination of physical and chemical parameters of table beets (liquefied solids, titrated acids, pH media, total sugar and pectin), an analysis of the liquid phase, raw and dry marrow and determination of physical and chemical parameters.. This research was conducted following methods: soluble solids were determined in accordance with GOST R51433 - 99, GOST 28562 - 90; acid titers GOST 51434 - 99, GOST 25555.0 - 82, pH of the medium GOST 26188 - 84, total sugar GOST 8756.13 - 87 and pectin GOST 29059 - 91.

At the same time, it was found that in the tested samples of Bordeaux table beet, the treatable acidity was 0.09%, the total sugar was 18.02%, the soluble solids were 18.4%, the pH of the medium was 5.65%, and the pectin was 1.18%, respectively. In raw pulp, all of these indicators slightly decreased, in particular titratable acidity by 0.01%, total sugar by 5.95%, soluble solids by 2.0%. At the same time, since soluble pectin partially converted (0.10%) to the liquid fraction in crude marc, the total pectin content was 0.91%, and in dry marc, 0.86%. The received some small distinctive results for these indicators are related to varietal characteristics of the study sample taken for beet. In addition, the obtained results on the total pectin content in raw and dry squeezes is a difference of 0.05-0.11%, which indicates the preservation of pectin pomace from these varieties of table beets in dried form. Dried raw materials for producing pectin-containing extract will be stored under room conditions (20-22°C), which undoubtedly reduces the cost of technology and helps to obtain products regardless of the season of the year.

Results and discussion. Based on the results of research, it was found that a table of beet varieties "Bordo" on the yield of pomace is quite suitable for obtaining pectin-containing concentrate. The moreover, it was found that in the process of obtaining the liquid phase from table beet, only $0.10 \pm 0.02\%$ of pectin passes, i.e. 1/10 honor, which according to the literature is known to be insufficient for stable long-term preservation in a biologically digestible form of as part of the production of vital complexes of vitamins and trace elements in the process of their thermal and other effects. The during the experiments also revealed that the total content of pectin in wet and dry pomace same.

Therefore, for further research work on the production of pectin-containing concentrate from these beetroot varieties, it is possible to use a gentle process to dry them and use them for these purposes in the future, which will facilitate the process of storing raw materials and the possibility of creating reserves for obtaining the marked preparation.

According to literature evidence, it was found that in the process of drink production, it does not dissolve, it goes almost entirely into squeezing vegetables.

The therefore, the development of effective technologies for the extraction of pectin, sparingly enzymatic method, from squeezing vegetables, in particular from table beets, after their processing, i.e. receiving food, в том числе овощных напитков, including vegetable drinks, with subsequent enrichment of their pectin containing concentrate, is very necessary and actual in the technological process of their production.

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ҚҰРАМЫНДА ПЕКТИН БАР ӨНІМДЕРДІ ӨНДІРУ ҮШІН ҚЫЗЫЛШАНЫ ПАЙДАЛАНУДЫҢ ОРЫНДЫЛЫҒЫН ЗЕРТТЕУ ТАМАҚ ӨНЕРКӘСІБІ ҮШІН СЫҒЫНДЫСЫ

Түйін: Бұл мақалада Алматы облысының Қайнар ауылынан алынған «Бордо» асханалық қызылшасының физикалық-химиялық параметрлерін (еритін қатты денелер, титрленген қышқылдар, рН, қант және пектин) анықтау нәтижелері сипатталған.

Асханалық қызылшаның құрамындағы сұйытылған қатты заттар, титрленген қышқылдар, ортаның рН, жалпы қант және пектиндер, сұйық фазаны, шикі және құрғақ паста сығындыларын талдау және физикалық-химиялық көрсеткіштерін анықтау арқылы орындалды. Сұйытылған қатты заттар, титрленген қышқылдар, ортаның рН, жалпы қант және пектин мөлшерін, сұйық фазаны, шикі және құрғақ паста сығындыларын талдау және физика-химиялық параметрлерін анықтау арқылы орындалды. Зерттеу келесі әдістермен жүргізілді: еритін құрғақ заттар ГОСТ Р51433 - 99, ГОСТ 28562 - 90 бойынша, қышқылдардың титрі ГОСТ 51434 - 99, ГОСТ 25555.0 – 82, ортаның рН ГОСТ 26188 – 84, жалпы қант мөлшері ГОСТ 8756.13 - 87 және пектин ГОСТ 29059 - 91 арқылы анықталды.

Түйінді сөздер: пектин, қызылша, қышқыл, сұрып, қант, көкөніс, дәрумен.

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ИССЛЕДОВАНИЕ ЦЕЛЕСООБРАЗНОСТИ ИСПОЛЬЗОВАНИЯ СВЕКЛЫ ДЛЯ ПРОИЗВОДСТВА ПЕКТИНОСОДЕРЖАЩИХ ПРОДУКТОВ ЭКСТРАКТ ДЛЯ ПИЩЕВОЙ ПРОМЫШЛЕННОСТИ

Резюме: В данной статье описаны результаты определения физико-химических параметров (растворимых твердых веществ, титрованных кислот, рН, общего сахара и пектина) из столовой свеклы «Бордо», полученной из села Кайнар Алматинской области.

Определить физико-химические параметры свеклы (растворимые сухие вещества, рН титруемой кислоты, общий сахар и пектин), анализ жидкой фазы, сырых и сухих стручков свеклы, физико-химические показатели. При этом исследования проводилась с использованием следующих методов: растворимые сухие вещества определялись по ГОСТ Р51433 - 99, ГОСТ 28562 - 90, титрованные кислоты - ГОСТ 51434 - 99, ГОСТ25555.0 - 82, рН среды по ГОСТ 26188. - 84, общий сахар по ГОСТ 8756.13 - 87 и пектин по ГОСТ 29059 - 91.

Ключевые слова: пектин, свекла, кислота, сорт, сахар, овощи, витамин