

ISSN 2518-1491 (Online),
ISSN 2224-5286 (Print)

ҚАЗАҚСТАН РЕСПУБЛИКАСЫ
ҰЛТТЫҚ ҒЫЛЫМ АКАДЕМИЯСЫНЫҢ

Д.В.Сокольский атындағы «Жанармай,
катализ және электрохимия институты» АҚ

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ИЗВЕСТИЯ

НАЦИОНАЛЬНОЙ АКАДЕМИИ НАУК
РЕСПУБЛИКИ КАЗАХСТАН
АО «Институт топлива, катализа и
электрохимии им. Д.В. Сокольского»

NEWS

OF THE ACADEMY OF SCIENCES
OF THE REPUBLIC OF KAZAKHSTAN
JSC «D.V. Sokolsky institute of fuel, catalysis
and electrochemistry»

SERIES
CHEMISTRY AND TECHNOLOGY

1 (439)

JANUARY – FEBRUARY 2020

PUBLISHED SINCE JANUARY 1947

PUBLISHED 6 TIMES A YEAR

ALMATY, NAS RK

NAS RK is pleased to announce that News of NAS RK. Series of chemistry and technologies scientific journal has been accepted for indexing in the Emerging Sources Citation Index, a new edition of Web of Science. Content in this index is under consideration by Clarivate Analytics to be accepted in the Science Citation Index Expanded, the Social Sciences Citation Index, and the Arts & Humanities Citation Index. The quality and depth of content Web of Science offers to researchers, authors, publishers, and institutions sets it apart from other research databases. The inclusion of News of NAS RK. Series of chemistry and technologies in the Emerging Sources Citation Index demonstrates our dedication to providing the most relevant and influential content of chemical sciences to our community.

Қазақстан Республикасы Ұлттық ғылым академиясы "ҚР ҰҒА Хабарлары. Химия және технология сериясы" ғылыми журналының Web of Science-тің жаңаланған нұсқасы Emerging Sources Citation Index-те индекстелуге қабылданғанын хабарлайды. Бұл индекстелу барысында Clarivate Analytics компаниясы журналды одан әрі the Science Citation Index Expanded, the Social Sciences Citation Index және the Arts & Humanities Citation Index-ке қабылдау мәселесін қарастыруда. Web of Science зерттеушілер, авторлар, баспашылар мен мекемелерге контент тереңдігі мен сапасын ұсынады. ҚР ҰҒА Хабарлары. Химия және технология сериясы Emerging Sources Citation Index-ке енуі біздің қоғамдастық үшін ең өзекті және беделді химиялық ғылымдар бойынша контентке адалдығымызды білдіреді.

НАН РК сообщает, что научный журнал «Известия НАН РК. Серия химии и технологий» был принят для индексирования в Emerging Sources Citation Index, обновленной версии Web of Science. Содержание в этом индексировании находится в стадии рассмотрения компанией Clarivate Analytics для дальнейшего принятия журнала в the Science Citation Index Expanded, the Social Sciences Citation Index и the Arts & Humanities Citation Index. Web of Science предлагает качество и глубину контента для исследователей, авторов, издателей и учреждений. Включение Известия НАН РК в Emerging Sources Citation Index демонстрирует нашу приверженность к наиболее актуальному и влиятельному контенту по химическим наукам для нашего сообщества.

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[ISSN 2518-1491 \(Online\)](#)

[ISSN 2224-5286 \(Print\)](#)

Меншіктенуші: «Қазақстан Республикасының Ұлттық ғылым академиясы» Республикалық қоғамдық бірлестігі (Алматы қ.)

Қазақстан республикасының Мәдениет пен ақпарат министрлігінің Ақпарат және мұрағат комитетінде 30.04.2010 ж. берілген №1089-Ж мерзімдік басылым тіркеуіне қойылу туралы куәлік

Мерзімділігі: жылына 6 рет.

Тиражы: 300 дана.

Редакцияның мекенжайы: 050010, Алматы қ., Шевченко көш., 28; 219, 220 бөл.; тел.: 272-13-19; 272-13-18,
<http://chemistry-technology.kz/index.php/en/arhiv>

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Типографияның мекенжайы: «NurNaz GRACE», Алматы қ., Рысқұлов көш., 103.

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«Известия НАН РК. Серия химии и технологии».

[ISSN 2518-1491 \(Online\)](#)

[ISSN 2224-5286 \(Print\)](#)

Собственник: Республиканское общественное объединение «Национальная академия наук Республики Казахстан» (г. Алматы)

Свидетельство о постановке на учет периодического печатного издания в Комитете информации и архивов Министерства культуры и информации Республики Казахстан №10893-Ж, выданное 30.04.2010 г.

Периодичность: 6 раз в год

Тираж: 300 экземпляров

Адрес редакции: 050010, г. Алматы, ул. Шевченко, 28; ком. 219, 220; тел. 272-13-19; 272-13-18,

<http://chemistry-technology.kz/index.php/en/arhiv>

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News of the National Academy of Sciences of the Republic of Kazakhstan. Series of chemistry and technology.
[ISSN 2518-1491 \(Online\)](#),

[ISSN 2224-5286 \(Print\)](#)

Owner: RPA "National Academy of Sciences of the Republic of Kazakhstan" (Almaty)

The certificate of registration of a periodic printed publication in the Committee of Information and Archives of the Ministry of Culture and Information of the Republic of Kazakhstan N 10893-Ж, issued 30.04.2010

Periodicity: 6 times a year

Circulation: 300 copies

Editorial address: 28, Shevchenko str., of. 219, 220, Almaty, 050010, tel. 272-13-19; 272-13-18,
<http://chemistry-technology.kz/index.php/en/arhiv>

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Editorial address: Institute of Organic Catalysis and Electrochemistry named after D. V. Sokolsky
142, Kunayev str., of. 310, Almaty, 050100, tel. 291-62-80, fax 291-57-22,
e-mail: orgcat@nursat.kz

Address of printing house: «NurNaz GRACE», 103, Ryskulov str, Almaty.

NEWS

OF THE NATIONAL ACADEMY OF SCIENCES OF THE REPUBLIC OF KAZAKHSTAN
SERIES CHEMISTRY AND TECHNOLOGY

ISSN 2224-5286

<https://doi.org/10.32014/2020.2518-1491.2>

Volume 1, Number 439 (2020), 15 – 21

UDC 664.8.047

IRSTI 65.53.33

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RESEARCH AND ANALYSIS OF DRIED KISHMISH AND RAISINS FROM GRAPES OF SOUTH KAZAKHSTAN

Abstract. Dried fruits, including raisins, are of particular interest in nutritional studies due to its unique chemical composition and natural qualities, which make raisins an attractive source of nutrients. Research and analysis of kishmish and dried raisins was performed in the department "Food Engineering" of M. Auezov SKSU. Dried fruits were prepared by scientifically justified and developed technology of drying fruits to obtain domestic environmentally friendly dried grapes by infrared irradiation after pre-treatment of raw materials without the use of chemical reagents.

From this study, it can be concluded that the kishmish and raisins obtained from grapes varieties "Kishmish black", "Bulls-eye", grown in South Kazakhstan region contain sufficient amount of sucrose (5.17 and 4.75 respectively). Given samples also show high contents of potassium (17.98 and 33.02 respectively), calcium (1.19 and 2.07 respectively), phosphorus (1.41 and 4.47 respectively), but iron contents is much less (0.21 and 0.27 respectively) than usually.

Consumers and stakeholders may get benefits by production and realization of suggested kishmish and raisins as regional brands of Kazakhstan or products with geographical indications (GI).

In the future it is necessary to carry out a lot of work on branding the products offered by the authors, provided that it will satisfy the following values, such as technological novelty, rarity and uniqueness of the product, environmental friendliness of the manufacture and use of the product.

Keywords: drying of fruits, grapes, kishmish, raisins, biochemical composition, minerals.

INTRODUCTION

Attention to the problem of nutrition is constantly growing both from the various segments of the population, and from the side of scientific research. At present, modern society is trying to adhere to a healthy lifestyle, to eat balanced foods that contain the necessary substances that support the normal functioning of the body. In the period of exacerbation of chronic diseases (in spring and autumn), as well as in winter, to compensate for the lack of vitamins, micro and macro elements, the pharmaceutical industry offers a wide range of chemically synthesized multicomponent vitamin and mineral complexes. Such complexes are significantly different from native forms, and are characterized by insufficient digestibility by the body [1-3].

In this regard, as sources of vitamins, micro- and macroelements and dietary fiber, as well as a wide range of bioactive components, it is advisable to introduce dried products in a natural or industrial way - dried fruits. It should be noted that modern industrial drying technologies make it possible to preserve most of the biologically active substances in dry fruits, and their amount will be higher than in fresh raw materials due to the removal of moisture from the fruits [4,5].

Dried fruits, including raisins, are of particular interest in nutritional studies due to its unique chemical composition and natural qualities, which make raisins an attractive source of nutrients. Raisins, like other fruits, are free of fats, saturated fats and cholesterol. They are a source of dietary fiber, fructooligosaccharides (fructans), tartaric acid and fruit acid, polyphenolic substances, minerals - potassium, phosphorus, magnesium, iron[6,7].

For the preparation of dried grape products use a crop of special varieties. About 95% of the dried products of all countries of the world are produced from seedless grapes and about 5% - grapes with seed. Dried products made from seedless species are called kishmish and currant, and made from grapes with seed are called raisins. Seedless grape varieties are represented by two groups: kishmish (Round kishmish, Oval kishmish, Black kishmish) and currant (Black currant, White currant, Pink currant). The main grapes of raisins are “Bulls-eye”, Sultani, Tayfi Pink, etc.[8].

Commercial and taste qualities of dried grapes are determined primarily by the quality of raw materials. The following basic requirements are imposed on fresh grapes intended for drying: the consistency of the pulp of the berries must be dense and fleshy, otherwise dried berries are poorly made, wrinkled and have no attractive appearance, in addition, the yield of dried produce is reduced. A mandatory indicator for kishmish and raisins is the high sugar content of the berry juice. The yield of dried products directly depends on its level. For a group of kishmish, it should be at least 23-25%, raisins - at least 22-23%. In their composition, the grapes must be loose, medium-loose or friable; otherwise the process of drying them becomes more difficult. Valuable properties of grape varieties intended for the preparation of dried products are seedlessness and early ripening of berries [9-11].

Thus, the development of technology for producing domestic dried fruits: kishmish and raisins with seeds are very relevant.

MATERIALS AND METHODS

At different stages of work, the objects of the study were local species of grapes “Kishmish black”, “Bulls-eye” obtained in the local markets and dried fruits –kishmish and raisins.

Experimental drying was carried out on a drying unit SD-4 of the department "Food Engineering" of M. Auezov SKSU according to the innovative patent of the Republic of Kazakhstan for No. 20923; as a result dried fruits in the form of kishmish and raisins were obtained.

Analysis of dried fruits were carried out in the Experimental and Regional Laboratory of Engineering Profile Constructional biochemical material (IRLIP “KBM”) at M. Auezov South Kazakhstan State University and at the scientific and laboratory base of the testing laboratory of Academy of Nutrition - Nutritest LLP (Almaty) using all standard and generally accepted methods.

RESULTS AND DISCUSSION

Present investigation was carried out to research and analyze kishmish and raisins from grapes of South Kazakhstan, obtained by scientifically justified and developed technology of drying fruits to obtain domestic environmentally friendly dried grapes by infrared irradiation after pre-treatment of raw materials without the use of chemical reagents[12]. Special pre-treatment of raw materials allows to emphasize the naturalness of the taste of the products, as well as to preserve all the necessary useful properties (vitamins and minerals).

Raisins, as part of the daily diet, have a combination of attractive, sweet taste and high nutritional value. Chemical composition of raisins includes essential nutrients, soluble and insoluble dietary fibers, as well as biologically active health components.

Table 1 shows nutrient compositions of kishmish (seedless raisins) and raisins with seeds of “Bulls-eye” grapes. Both raisins and kishmish provide similar amounts of sugar (62.60g and 62.24g, respectively), divided almost equally between fructose and glucose with sufficient amounts of sucrose. Raisins, like all fruits, are high in potassium and low in sodium. Compared to other fruits, they are high in magnesium, calcium, phosphorus and iron (Table 2, Figures 1,2).

Table 1 - Biochemical composition of Kishmish (seedless raisins) and Raisins with seeds of “Bulls-eye” grapes

Nutrient	Kishmish (seedless raisins)	Raisins with seeds of “Bulls-eye” grapes
Water, %	21.4	20,39
Energy, kcal on 100 g	308	313
Carbohydrate, %	73.0	75.0
Sugars (total), %	62.6	62.24
Glucose, %	27.75	28.32
Fructose, %	29.68	29.75
Sucrose, %	5.17	4,75
Proteins, %	2.86	2,26
Fats, %	0.54	0.49
Mass fraction of ash, %	2.16	1.86

The competitiveness and advantage of dried fruit products produced by the developed technology is to obtain environmentally friendly products without the use of chemical preservatives and reagents. One of the main advantages of dried fruits in the south of Kazakhstan is high sugar content and aroma. In summer, solar air insolation is from + 35-45 °C in the shade and fruits grown in a dry, hot climate accumulate sucrose and fructose to the maximum. In dried fruits made in Turkey and Greece, located near the Black Sea due to high humidity, the sugar content in dried fruits is much less. So, content of sucrose of Kishmish (seedless raisins) and Raisins with seeds of “Bulls-eye” grapes of South Kazakhstan -5.17 and 4.75 respectively and for dried fruits made in Turkey and Greece, located near the Black Sea – approximately 0.14-0.98 [13-15].

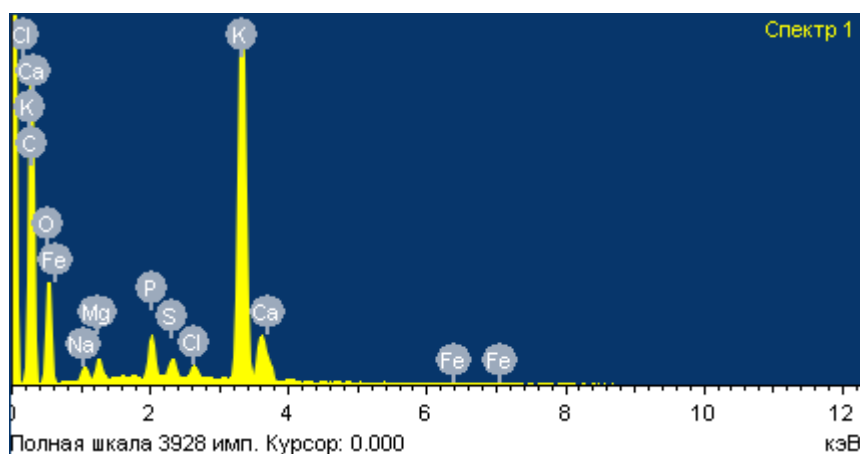
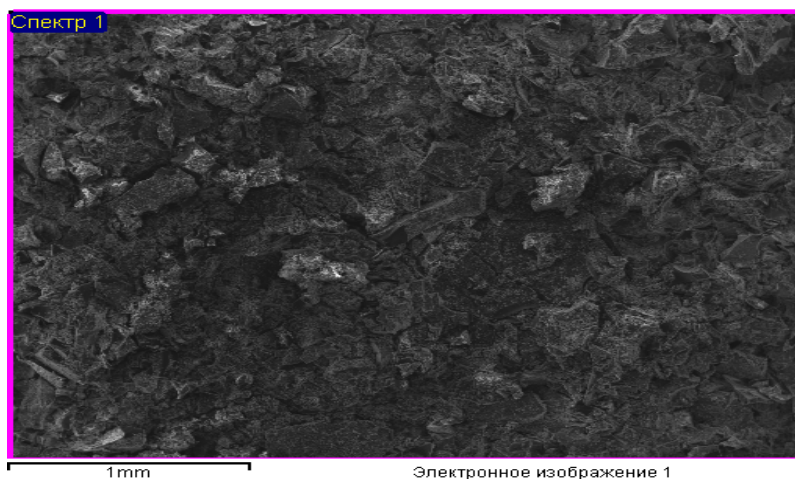


Figure 1 - Micro picture of Kishmish (seedless raisins)

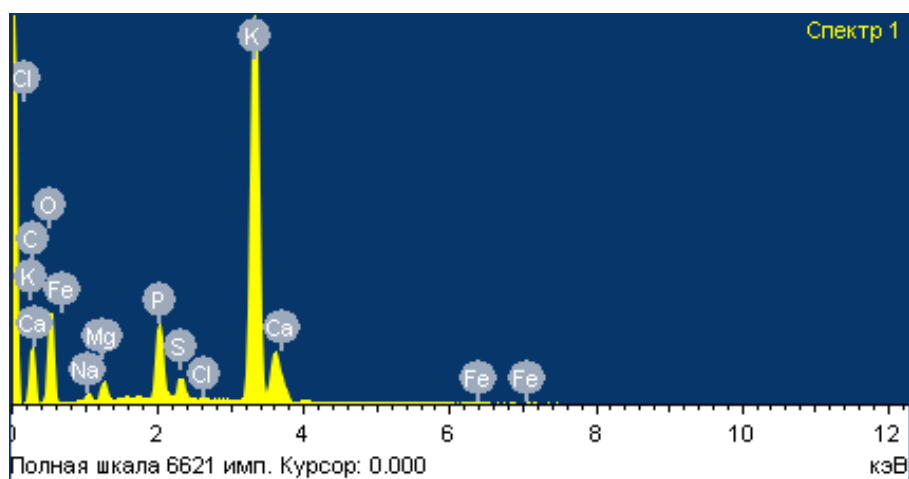
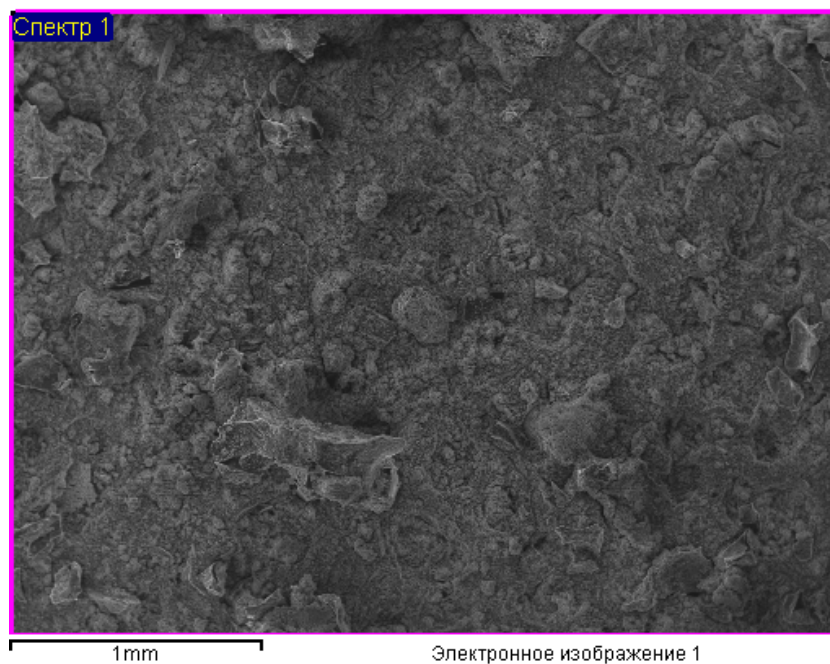


Figure 2 - Micro picture of Raisins with seeds of “Bulls-eye” grapes

Table 2 - Mineral composition of Kishmish (seedless raisins) and Raisins with seeds of “Bulls-eye” grapes

Kishmish (seedless raisins)		Raisins with seeds of “Bulls-eye” grapes	
Element	Weight, %	Element	Weight, %
C	52.33	C	21.43
O	24.42	O	35.27
Na	0.80	Na	0.84
Mg	0.73	Mg	1.20
P	1.41	P	4.47
S	0.63	S	1.27
Cl	0.50	Cl	0.17
K	17.98	K	33.02
Ca	1.19	Ca	2.07
Fe	0.21	Fe	0.27

CONCLUSIONS

Current research shows, that using progressive technology of infrared drying of fruits will allow you to get dried fruits with high consumer and taste. Thus, sucrose is retained to the maximum extent possible in the products obtained, the mass fraction of which in the kishmish is 5.17% with an energy value of 308 kcal/100g, and the mass fraction of sucrose in raisins with seeds is 4.75% with an energy value of 313kcal / 100g. In conclusion, raisins are rich in main minerals which are important for activity and maintenance. So, minerals as iron, potassium, magnesium, calcium, etc, and other biologically active substances are preserved in dry fruits, as well as taste nutritional values are kept. Furthermore, consumers and stakeholders may get benefits by production and realization of suggested kishmish and raisins as regional brands of Kazakhstan or products with geographical indications (GI)[16].

In the future it is necessary to carry out a lot of work on branding the products offered by the authors, provided that it will satisfy the following values, such as technological novelty, rarity and uniqueness of the product, environmental friendliness of the manufacture and use of the product.

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ОҢТҮСТІК ҚАЗАҚСТАННЫҢ ЖҮЗІМІНЕН ЖАСАЛҒАН КИШМИШ ПЕН МЕЙІЗДІ ЗЕРТТЕУ ЖӘНЕ ТАЛДАУ

Аннотация. Тамақтану проблемасына халықтың әртүрлі топтары тарапынан да, ғылыми зерттеулер тарапынан да үнемі назар аударылып келеді. Қазіргі уақытта қазіргі қоғам салауатты өмір салтын ұстануға тырысады, құрамында ағзаның қалыпты жұмысын қамтамасыз ететін қажетті заттар бар теңдестірілген тағамдар бар. Созылмалы аурулардың асқыну кезеңінде (көктемде және күзде), сондай-ақ қыста дәрумендер, микро және макроэлементтердің тапшылығын толтыру үшін фармацевтика өнеркәсібі химиялық синтезделген көп компонентті витаминді-минералды кешендердің кең спектрін ұсынады. Мұндай кешендер табиғи формалардан едәуір ерекшеленеді және ағзаның жеткіліксіз сіңімділігімен сипатталады.

Кептірілген жемістер, мейізді қоса алғанда, өзінің бірегей химиялық құрамы мен табиғи қасиеттерінің арқасында қоректік заттардың тартымды көзі болып табылады. Кішмиш және кептірілген мейізді зерттеу және талдау М. Әуезов ат. ОҚМУ-да "Тамақ инженерия" кафедрасында жүргізілді. Кептірілген жемістер химиялық реагенттерді пайдаланбай шикізатты алдын ала өңдегеннен кейін отандық экологиялық таза кептірілген жүзім алу үшін ғылыми негізделген және әзірленген жеміс кептіру технологиясы бойынша дайындалған.

Осы зерттеуден Оңтүстік Қазақстан облысында өсірілген "Қара кишмиш", "Бычий глаз" жүзім сорттарынан алынған кішмиш пен мейіз құрамында жеткілікті сахароза (тиісінше 5,17 және 4,75) бар деген қорытынды жасауға болады. Бұл үлгілер сондай-ақ калийдің (тиісінше 17,98 және 33,02), кальций (тиісінше 1,19 және 2,07), фосфордың (тиісінше 1,41 және 4,47) жоғары құрамын көрсетеді, бірақ темірдің мөлшері әдетте қарағанда әлдеқайда аз (тиісінше 0,21 және 0,27).

Тұтынушылар мен мүдделі тараптар үшін Қазақстанның өңірлік брендтері немесе географиялық көрсеткіштері бар өнімдер (GI) ретінде айтылған өнімдерді жасау және тарату өте пайдалы болуы мүмкін.

Болашақта авторлар ұсынған өнімдерді брендтеу бойынша көп жұмыс атқару қажет, егер ол технологиялық жаңашылдығы, өнімнің сирек және бірегейлігі, өнімді өндіру мен пайдаланудың экологиялық қауіпсіздігі сияқты келесі құндылықтарды қанағаттандыратын болса.

Түйін сөздер: жеміс кептіру, жүзім, кишмиш, мейіз, биохимиялық құрамы, минералдар.

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ИССЛЕДОВАНИЕ И АНАЛИЗ СУШЕНОГО КИШМИША И ИЗЮМА ИЗ ВИНОГРАДА ЮЖНОГО КАЗАХСТАНА

Аннотация. Внимание к проблеме питания постоянно растет как со стороны различных слоев населения, так и со стороны научных исследований. В настоящее время современное общество старается придерживаться здорового образа жизни, есть сбалансированные продукты, содержащие необходимые вещества, поддерживающие нормальное функционирование организма. В период обострения хронических заболеваний (весной и осенью), а также зимой, чтобы восполнить недостаток витаминов, микро- и макроэлементов, фармацевтическая промышленность предлагает широкий спектр химически синтезированных многокомпонентных витаминно-минеральных комплексов. Такие комплексы значительно отличаются от нативных форм и характеризуются недостаточной усвояемостью организмом.

Сухофрукты, включая изюм, представляют особый интерес в исследованиях в области питания благодаря своему уникальному химическому составу и природным качествам, которые делают изюм привлекательным источником питательных веществ. Исследования и анализ кишмишного и сушеного изюма проводились на кафедре «Пищевая инженерия» ЮКГУ им. М. Ауэзова. Сухофрукты готовили по научно обоснованной и разработанной технологии сушки плодов для получения отечественного, экологически чистого сушеного винограда инфракрасным излучением после предварительной обработки сырья без использования химических реагентов.

Из этого исследования можно сделать вывод, что кишмиш и изюм, полученные из сортов винограда «Кишмиш черный», «Бычий глаз», выращенных в Южно-Казахстанской области, содержат достаточное количество сахарозы (5,17 и 4,75 соответственно). Данные образцы также показывают высокое содержание калия (17,98 и 33,02 соответственно), кальция (1,19 и 2,07 соответственно), фосфора (1,41 и 4,47 соответственно), но содержание железа намного меньше (0,21 и 0,27 соответственно), чем обычно.

Потребители и заинтересованные стороны могут получить выгоды от производства и реализации предлагаемых кишмишей и изюма в качестве региональных брендов Казахстана или продуктов с географическими указаниями (GI).

Необходимо провести в дальнейшем большую работу по брендированию предлагаемых авторами продукции при условии, что она будет удовлетворять следующим ценностям, как технологическая новизна, редкость и уникальность продукта, экологичность изготовления и использования продукта.

Ключевые слова: сушка фруктов, виноград, кишмиш, изюм, биохимический состав, минералы.

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[ISSN 2518-1491 \(Online\)](#), [ISSN 2224-5286 \(Print\)](#)

Редакторы: *М. С. Ахметова, Г. Б. Халидуллаева, Д. С. Аленов*
Верстка на компьютере *А.М. Кульгинбаевой*

Подписано в печать 13.02.2020.

Формат 60x88¹/₈. Бумага офсетная. Печать – ризограф.
7,8 п.л. Тираж 300. Заказ 1.