

QUALITATIVE REQUIREMENTS OF THE PRODUCTION OF POMEGRANATE AND CHERRY COMPOTES

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The concept of the state policy in the field of healthy nutrition of the population provides for the improvement of the systems of cultivation, storage and processing of fruits and berries along the total way of their progress, from the field to the consumer. The use of high-quality ecologically clean raw materials, modern technologies and equipment is especially actual which ensure maximum preservation of nutrients, organoleptic advantages of the canned product thus increasing the expiration of the products. The analysis of the condition and processing of fruit and berry raw materials showed that scientists and specialists are seeking opportunities to preserve and use the harvested crop rationally thus ensuring that the competitiveness of the final product without using highly efficient various technologies is impossible. Consequently, the considered problem of development of biochemical and technological scientific bases of production of high-quality raw materials and technologies for its storage and processing throughout the technological cycle is topical and of great practical importance as well, especially in a market economy [1, 2].

Over the past few years, a large number of national brands have been identified in the vegetable and fruit canned market. Currently, vegetable and fruit cans are widely represented in the trade network.

Aim of the research - to study the biological value of cherries and pomegranate and the technology of producing cherry and pomegranate compotes.

Key words: quality, canned products, normative demands, degustation

Introduction

Fruit, berries and vegetables are processed by the fruit and vegetable industry including canning, vegetable-drying industries and the production of quick-frozen products. The word “can” originated from the Latin “conservo”, that means “save.” By the word **canned food** we understand food products of vegetable or animal origin which are specifically processed for long-term storage. The processing of fruits, berries and vegetables is important in preserving the harvest, ensuring the uninterrupted supply of food for the population during the years. The production and scientific organizations set the task to increase the quantity of processing fruits, berries, fruits and vegetables, to expand the varieties and to improve the quality of products. The use of high-quality ecologically clean raw materials, modern technologies and equipment that ensure maximum preservation of nutrients, organoleptic advantages of the product is of great importance that increases the expiration of the products. Timely solution of the tasks set will contribute to optimizing the nutrition of the population of Artsakh, increasing the competitiveness of domestic canned products in the local and foreign markets.

The problems of producing high-quality raw materials maximizing their storage during preservation and processing remain relevant. One of the determining factors for improving the complex system of fruit and berries production is the scientifically grounded approach to raw materials as an object of storage and processing, the quality of which is determined by the genotype of the variety, environmental, soil, climatic and technological factors. Varietal composition of raw materials is constantly updated which raises new tasks of selection of adaptive varieties for the region, development of varietal technology of cultivation, storage and processing [1, 3, 5].

Aim of the research - to study the biological value of cherries and pomegranate and the technology of producing cherry and pomegranate compotes.

Methodology: Compotes are dessert products made of fruits and berries filled with sugar syrup, hermetically sealed in containers and sterilized.

Increased sugar content and the use of fresh high quality raw materials for the preparation of compotes make them valuable in terms of nutrition. Therefore, the production of compotes is widespread. Compotes are made by almost all kinds of fruits and berries. Their name usually corresponds to the name of the species of fruit and berry raw materials. Apricot, cherry plum, grape, plum, cherry, raspberry, pomegranate, peach and pear compotes are especially of high food quality.

A variety of compotes are fruit filled with fruit juice and fruit in wine. Concentrated compotes from partially dehydrated fruits and berries are considered to be new kinds of compotes. Compotes from the fruits of stone crops are produced without seeds and from the pome fruits without ovary with skin or without skin for children and dietary food.

The most important technological task in the manufacture of compote from stone fruits is the improvement of the methods and devices used in their processing and allowing to increase the permeability of cells to accelerate the diffusion of syrup into fruits and to improve the quality of the ready compote on this basis[6].

From a mixture of fruits and berries, whole and cut into halves, slices or cubes various compotes-assortments are produced. Not only cultural, but also wild-growing raw materials such as red bilberry, cranberries, blackberries, gooseberries, cloudberries and ash berries are widely used for compotes as well.

The most suitable for compotes are sugary varieties having beautiful fruits with high taste qualities, with a good aroma, not boiling and not changing the color while being processed.

It is known from literature sources that high temperature and long term heat treatment deteriorate the quality of compotes during which the chemical composition and organoleptic parameters of the ready product change [7].

Therefore, a relatively short technological process of preparing compotes allows to preserve biologically valuable and active substances, natural color, taste and smell of fruits and berries practically without any changes from which the compotes are made. The content of dry substances in compotes is from 20 to 28% due to the introduction of sugar compotes into the recipes, so their caloric content is higher in comparison with juices. The higher the dry content of the raw material is, the lower the sugar consumption is when preparing the syrup. The main sugars are glucose and fructose and invert sugar which is formed from sucrose as a result of hydrolysis during heat treatment under the influence of organic acids contained in the raw material. Organic acids are present in amounts ranging from 0.2 to 1.3%, depending on their amount in the feedstock and also on the concentration of sugars in the syrup. Fiber is contained in small amounts (0.2-0.5). The total ash content of compotes is also insignificant and ranges from 0.2 to 0.5%.

Sometimes compotes are prepared from quick-frozen raw materials or sterilized semi-fabricated products if the fruit has retained its shape, has not changed its color and has not lost its elasticity. In this case, they often produce assorted compotes. Fruits and berries should be healthy for making compotes, without wormholes and spots, mechanical damages and other defects. They are removed in technical maturity. Unripe fruits contain many acids, they are poorly colored and therefore reduce the quality of compotes; overripe fruits are easy to boil during sterilization. The diameter of the fruit (for canning as whole fruit) should not be more than 45 mm.

Cherry and pomegranate compotes belong to the assortment group III "Canned fruits and berries (fruit)". Compote is a canned drink, made from fresh berries of cherry or pomegranate, filled with sugar syrup and sterilized. The chemical composition of cherry and pomegranate compote is enriched with vitamins of group A, B, C, E, and also PP. In addition, the benefits of these compotes is the high content of such useful macro and micro elements as calcium, potassium, iron, phosphorus, magnesium, sodium and beta-carotene. The benefits of cherry and pomegranate compotes are not only in the chemical composition of the product, but also in the excellent properties of the drink.

On the table you see the machine-technological scheme of producing the compotes.

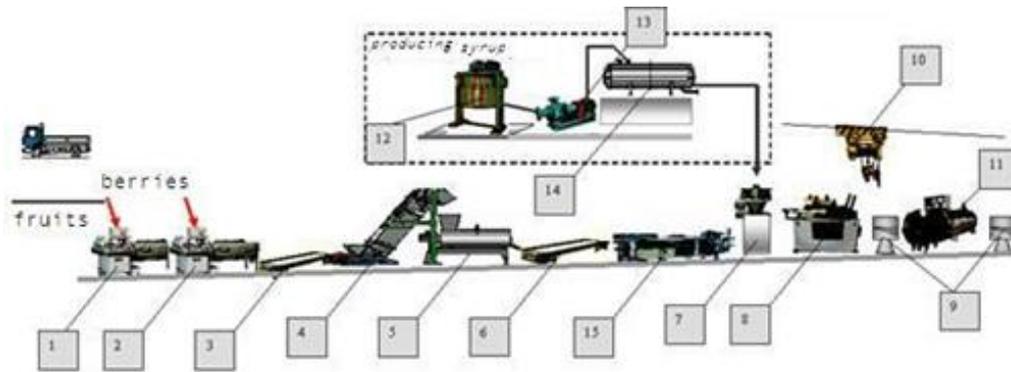


Fig 1. Machine-equipment scheme for the production of “Dietary and low caloric stewed fruit”.

1-washing machine KYM, 2 - washing machine KMI, 3 - inspecting transporter TCH, 4 -transporter elevator TЭ, 5 - auger steaming, 6 - filling transporter, 7 - filler for syrup, 8 - canning machine Ж7-YMT-6, 9 - installation of autoclavecontainer for uploading and downloading, 10 - multiple electric pulley, 11 - horizontal canning machine, 12 - boiling container MЭC-320M, 13 - pump, 14 - container for the syrup, 15 - Filler for fruiting part.

These compotes affect the level of hemoglobin in the blood. Thus, the drink helps to normalize the level of hemoglobin in anemia. In addition to the vitamin-mineral composition, special attention should be paid to the low caloric content of cherry and pomegranate compote, which amounts to only 57 kcal per 100 g. of berry drink, while garnet has 32 kcal. The energy value of the cherry compote (the ratio of proteins, fats, carbohydrates) is 0.2 g. (~ 1 kcal) proteins, 0.1 g. fats (~ 1 kcal), carbohydrates 13.8.g (~55 kcal) , and the energy value of the pomegranate compote: carbohydrates - 8 g. (32 kcal). For the production of cherry and pomegranate compote the following conditions must be created: a laboratory for quality analysis; necessary equipment for the production of compotes, a warehouse for raw materials and containers and storage for finished products as well. The preparation of compotes consists of the following technological operations: sorting, calibration, washing, cleaning, removal of bone and ovary (if necessary), blanching, packaging, syrup filling, capping and sterilization. When preparing raw materials, the share of the waste from the total weight of raw materials (6%) is taken into account as one of the main indicators. While blanching, digestion can occur and the faster it is, the higher the acidity of the raw material becomes [3]. The concentration of sugar syrups is usually set in the range of 30-60% in accordance with the characteristics (mainly acidity) of the raw materials. So, they take 30% syrup for grapes of Hungarian type; for apples, pears, sweet cherries - 35%; quince - 40%; raspberries, strawberries, cherries, cherry plums - 60%. To prepare the syrup, you should use water in which the fruits are blanched. For the production of cherry and pomegranate compote, raw materials are used in accordance with the requirements. Fruits must be clean, whole, fresh, healthy, without excessive moisture, mechanical damage and wormholes, not cracked, well preserved form, without foreign smell and taste [4]. Cherry, intended for processing, is divided into two commodity grades: the first and the second. For the first grade, the fruits should be typical in shape and color, for a given pomological grade they should be homogeneous in color, not green and unrestricted. Size should not be less than 15 mm for large fruit, and for small-fruited - not less than 12 mm. For the second grade, the fruits can be typical and atypical in form. Difference in color is allowed. The size is not standardized. Standard fruits without stem (if the main weight is with the peduncle), with healed mechanical damages, fruits with fresh mechanical damages (crumpled or with cracks in the peduncle) and with healed damage to pests are allowed. Green, crushed, overripe fruits with signs of fermentation, with wormholes are not allowed. The degree of maturity in the procurement should be so that the fruits and seeds can withstand transportation, and to the destinations they should have the appearance and taste, corresponding to the consumer degree of maturity. The content of toxic elements and pesticides should not exceed the permissible levels established by medical and biological requirements and sanitary standards of quality of food raw materials and food products. The compote should meet the following requirements: fruits or seeds are clean, without mechanical damage and wormholes, undiluted, unrestrained, in well-preserved form. The following is allowed: unequal in size fruits, no more than: for premium - 10%, for the first - 20%,

for table - without restrictions; - fruits with cracked but not slipped skin, for premium - no more than 10%, for the first - 20%, for dining class - 50%; - boiled, partially lost form fruits for the highest grade are not allowed, for the first grade - not more than 25%, for the table - not more than 50%. The syrup is transparent or slightly opalescent, without foreign impurities [3, 5]. Taste and smell: well-expressed, typical for cherries and pomegranates compotes are made of, without foreign smell and taste [2, 5].

Technological scheme of the can production “Cherry and pomegranate compotes” is shown in the vector scheme in Figure 2.

Basic calculations [8].

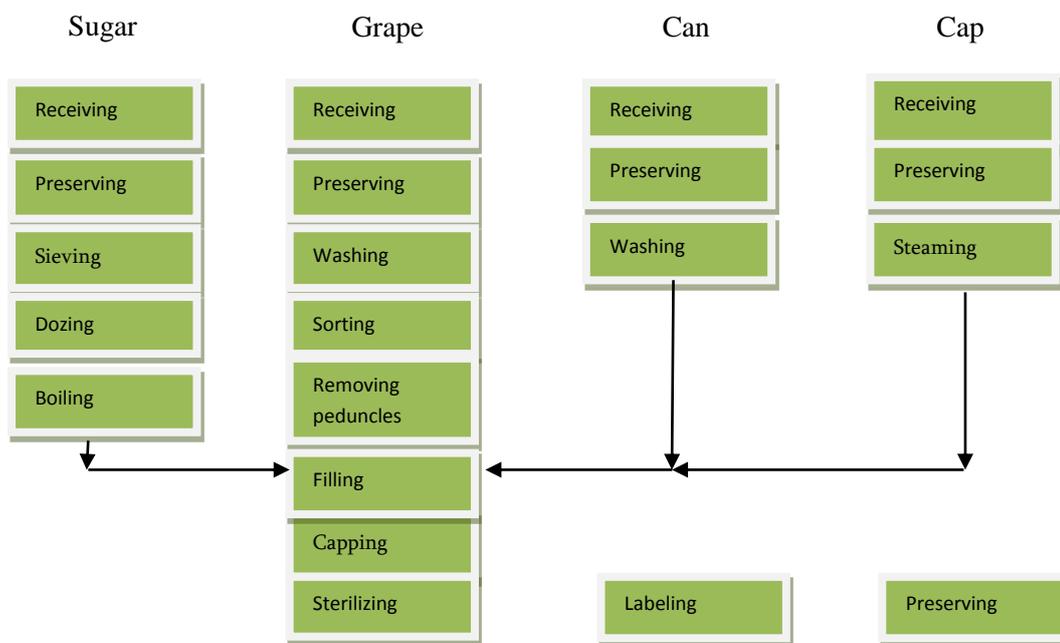


Fig. 2. Vector scheme of the can production “Cherry and pomegranate compotes”

Count of production line

Productivity of the technological line is counted by the formula 1.1:

$$\Pi_c = 3_c / K \tag{1.1}$$

where: Π_c – productivity of the line, cans/change;

3_c – task for producing cans, kg/change;

K – coefficient of over counting of physical cans conditionally

The norms of loss and waste of raw material

For each sort of raw material and semi-fabricates the summative norm of waste and loss is calculated, and the norms of loss and waste for separate operations in percentage with the direction what mass of raw material and semi fabricates they are taken from.

Count of norms of raw material for one ton of cans

Total waste of raw material is counted by the formula 1.2

$$T = S * 100 / 100 - X \tag{1.2}$$

where: T – norm of waste of raw for one ton, kg;

S – the quantity of processed product according to the recipe, kg;

X – sum of loss and waste according to operations in % to the mass of initial raw, %

Count of line power

Count of change able line power is produced by the formula 1.3.

$$N_c = S_c / \varphi \quad (1.3)$$

where: N_c – changing line power in tons of ready product, t/chng;

S_c – changing task in tubes of ready product, t/chng;

φ – coefficient of using the changeable power of equipment, accepted by ($\varphi = 0,8-0,9$).

Transfer of tubes in tones:

$$35 \cdot 0,353 = 12,355 \text{ t\change}$$

$$N_c = 12,355 / 0,8 = 15,45 \text{ tons of change.}$$

Count of time line power by the formula 1.4:

$$N_{\tau} = N_c / \tau \quad (1.4)$$

where: N_{τ} – time line power in tons of ready product, t/h;

τ – number of hours in change.

Count of productive program of can production

The productive program of can production “Cherry and pomegranate compote” during the period is given in the Table 1.5. Count of productive program of can production is expressed by the formula 1.5.

$$N_r = N_c \cdot \Phi_{\text{chng/yea}} , \quad (1.5)$$

where: N_r – annual line power in tons of ready product, t/h;

N_c – changing line power in tons of ready product, t/h;

$\Phi_{\text{chng/yea}}$ – number of working changes in a year.

Conclusion. Having studied the proposed materials for the production of cherry and pomegranate compote, we may conclude: canning can compensate for the deficit of fruit and vegetable products in the population's nutrition in the winter-spring period; reduce losses of berries, fruits and vegetables during the storage; create state reserves in the event of a crop failure or a natural disaster; to increase the nutritional value of food products by enriching them with various components, by boiling, by the separation of low-valued parts of raw materials in preparation for canning.

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ՆՈԱՆ ԵՎ ԲԱԼԻ ԿՈՄՊՈՆՆԵՐԻ ԱՐՏԱԴՐՈՒԹՅԱՆ ՈՐԱԿԻՆ ՆԵՐԿԱՅԱՑՎՈՂ ՊԱՀԱՆՋՆԵՐԸ

Ռ.Ս. Հակոբյան, Ա.Յ. Արզումանյան, Շ.Ա. Դավթյան, Ի.Գ. Նավթալյան

Շուշիի տեխնոլոգիական համալսարան

Բնակչությանն առողջ սննդով ապահովելու նպատակով՝ հանրային քաղաքականությունն ակնկալում է մրգերի մշակման և պահպանման փուլերն ամբողջ ցիկլում բարելավել՝ սկսված դաշտից մինչև սպառող: Առավել արդիական է օգտագործել բարձրորակ, էկոլոգիապես մաքուր հումք, կիրառել ժամանակակից տեխնոլոգիաներ և սարքավորումներ, որոնք ապահովում են սննդանյութերի, միկրո- և մակրոէլեմենտների առավելագույն պահպանումը, պահածոյացված արտադրանքի օրգանոլեպտիկ հատկությունները, ինչպես և պահպանման ու պիտանելության ժամկետները:

Մրգահատապտղային հումքի որակի և մշակման ուսումնասիրությունները վկայում են, որ գիտնականներն ու մասնագետները փնտրում են օպտիմալ մեթոդներ՝ աճեցված բերքի ռացիոնալ օգտագործման ու պահպանման համար: Այնուամենայնիվ, վերջնական արտադրանքի մրցունակության ապահովումն անհնարին է, առանց բարձր արդյունավետությամբ տեխնոլոգիաների օգտագործման:

Խնդրի լուծման լավագույն տարբերակն է՝ ազգաբնակչությանը պահպանման ու պահածոյման հիմքում ընկած գործընթացների, ինչպես նաև՝ բաղադրատոմսերի ու ռեժիմների պահպանմամբ, պարզագույն տեխնոլոգիաների

իրականացման ուսուցումը: Կարևորվում է նաև եղած սարքերի ճիշտ օգտագործման, պարզ հարմարանքների պատրաստման և կիրառման ուսուցումը, ինչպես նաև վտանգավոր սննդամթերքների տարբերակման ունակությունը:

Աշխատանքի նպատակն էր՝ ուսումնասիրել նոսան և բալի կենսաբանական արժեքը, ինչպես և դրանց համապատասխան կոմպոտների արտադրության տեխնոլոգիան:

Բանալի բառեր. որակ, պահածոներ, կարգավորիչ պահանջներ, համտեսում

ТРЕБОВАНИЯ К КАЧЕСТВУ ПРОИЗВОДСТВА КОМПОТОВ ИЗ ВИШНИ И ГРАНАТА

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Концепцией государственной политики в области здорового питания населения предусматривается совершенствование систем возделывания, хранения и переработки плодов и ягод на всем пути их продвижения – от поля до потребителя. Особую актуальность имеет использование высококачественного экологически чистого сырья, современных технологий и оборудования, обеспечивающих максимальную сохранность питательных веществ, органолептические достоинства консервированного продукта, повышение сроков его хранения. Анализ состояния и переработки плодово-ягодного сырья показал, что ученые и специалисты изыскивают возможности сохранения и рационального использования выращенного урожая, однако обеспечение конкурентоспособности конечного продукта без применения высокоэффективных сортовых технологий невозможно. Исходя из этого, рассматриваемая проблема развития биохимических и технологических научных основ производства высококачественного сырья, а также технологий его хранения и переработки по всему технологическому циклу является актуальной и имеет важное практическое значение, особенно в условиях рыночной экономики [1, 2].

За последние несколько лет на рынке овощных и фруктовых консервов обозначилось большое количество национальных марок. В настоящее время в торговой сети широко представлены овощные и фруктовые консервы.

Целью работы было изучить биологическую ценность вишни и граната, а так же технологию производства компота вишневого и гранатового.

Ключевые слова. качество, консервированные продукты, нормативные требования, дегустация