

MODERN APPROACHES TO IMPROVING THE TECHNOLOGY OF EMULSION-TYPE SAUCES

Focusing on healthy eating and the desire to consume environmentally friendly products is the basis for active renewal of the range of sauces produced and sold, as sauces are an integral part of the daily diet. Traditional sauces, which are mainly used for cold dishes, can no longer fully meet the growing needs of the restaurant business, and sauces intended for use in hot form or in the production of hot dishes need to be significantly expanded. At the same time, little attention is paid to improving the consistency of sauces. Therefore, the urgent task of the food industry is research in the direction of developing technologies of mayonnaise sauces, which in addition to improving the nutritional and biological value of finished products will reduce the cost of their production by reducing the content of expensive structuring ingredients.

Keywords: emulsion sauces, pectin substances, diversification, nutritional value, biological value.

А.Г. ФАРИСІЄВ, Г.В. НОВИК, О.Ю. ВІЄНКО

Дніпровський національний університет імені Олеся Гончара

СУЧАСНІ ПІДХОДИ ДО УДОСКОНАЛЕННЯ ТЕХНОЛОГІЇ СОУСІВ ЕМУЛЬСІЙНОГО ТИПУ

Орієнтування на здорове харчування та бажання споживати екологічно чисту продукцію є підставою для активного оновлення асортименту соусів, що виробляються та реалізуються, оскільки соуси – це невід’ємна частина щоденного раціону людини. Традиційні соуси, які застосовуються переважно для холодних страв, вже не можуть в повній мірі задовольнити зростаючі потреби ресторанного бізнесу, а соуси, призначені для використання в гарячому вигляді або у виробництві гарячих страв, потребують значного розширення. При цьому питанням покращення консистенції соусів приділяється мало уваги. Тому дослідження у напрямку розробки таких технологій майонезних соусів, які окрім покращення харчової та біологічної цінності готових виробів дозволять здешевити вартість їх виробництва шляхом зменшення вмісту дорогавартісних структуроутворюючих інгредієнтів є актуальним завданням харчової промисловості.

Ключові слова: емульсійні соуси, пектинові речовини, розширення асортименту, харчова цінність, біологічна цінність.

Target setting. Until about 2016, the restaurant business in Ukraine could be considered one of the few areas of profitable investment, but today, due to the difficult economic situation in the country, the competition of these institutions has grown almost exponentially. Thus, in conditions of fierce competition, entrepreneurs face a serious problem of attracting new and retaining existing consumers, which can be solved by updating the range of products and additional services [1].

It should be noted that a significant proportion of competitive restaurants have their own concept, which is primarily reflected in the menu of the institution. Restaurateurs in developing the menu focus on consumer demand, which has become more demanding on the quality of food and its organic composition.

It is well known that about 70% of the dishes sold in restaurants are served with sauces. This allows not only to improve the appearance, taste and aroma of the finished dish, but also to increase the content of useful nutrients [2].

According to modern trends in healthy eating, the market of sauces in Ukraine is no exception and it can be noted that consumers are increasingly focused on healthy eating and are willing to consume environmentally friendly products [3]. This creates the preconditions for active updating of the range of sauces produced and sold according to the principles of logistics [4, 5].

Purpose statement (research objective). The purpose of the article is to identify current trends in new technologies for the production of sauces for restaurants both in Ukraine and abroad. To achieve this goal within the limits of this article the following scientific tasks have been solved: analysis of improvement or development of new technologies of emulsion-type sauces; determination of types of additives used in the manufacture of sauces; features of application of additives in sauces are covered.

Actual scientific researches and issues analysis. Studying the technology of sauces, it can be noted that to ensure the stability of the emulsion system, their production involves the use of polysaccharides of various origins, including natural and synthetic [6].

Scientists of the Odessa National Academy of Food Technologies are actively researching the development of technology and recipes for the production of dressing sauces [7] based on guar gum with a mass fraction of 0.6 ... 0.8 with water solvent and replacing sucrose with fructose to reduce sugar in creative sauce.

The required texture of dressing sauces is provided by the use of hydrocolloids with different physicochemical properties, such as locust bean gum and a composite mixture of xanthan gum and kappa carrageenan. In order to form the consistency of the sauce and the presence of particles of the product in the suspended state, treatment of pepper and walnut particles with sunflower lecithin, which forms a hydrophobic shell on the surface of the pieces of suspended components. A characteristic feature of the resulting dressing sauces is low caloric content, colour and taste, low viscosity of the structure and high content of biologically valuable substances due to the presence of particles of berries, nuts and vegetables. In addition, the recipe of nut sauces has been

improved by adjusting the content of polyunsaturated fatty acids in accordance with physiological norms of consumption [8].

One of the modern approaches to the use of polysaccharides in emulsion-based sauces is the possibility proposed by the authors [9] to combine fruit and berry puree, flavouring and composite mixture of polysaccharides (gum arabic, pectin) in the amount of 15% by weight of fruit and berry puree and obtain sauces with high content of micro- and macroelements.

Scientists [10] have improved the production technology and developed recipes for sauces that can be used in molecular cuisine. This development allows to apply the process of spherification of sauce products, which became possible due to the use of chitosan and agaroid in the developed formulations as stabilizers and emulsifiers.

The issue of increasing the shelf life of food products in the oil and fat industry with the maximum compliance with the initial quality is the authors [11]. To this end, a study of the effect of fortifying additives on the formation of the quality of mayonnaise in order to develop a functional product with improved storage ability. It is established that the use of rosemary extract and biologically active drug «Nova SOL Q» in the calculated dosages allows to preserve the primary quality of the oil-fat emulsion. This is achieved by stabilizing the oxidative and microbiological spoilage of the product against the background of the manifestation of antioxidant properties of the studied enrichment additives, thereby extending the shelf life of mayonnaise.

All these additives, in particular guar gum, gum arabic, pectin extend the shelf life of sauces and reduce the demulsification.

As you know, in restaurants there is no need for long-term storage of the finished product and we can assume that the addition of stabilizers to sauces as additives is not appropriate.

As stabilizers it is possible to recommend unconventional vegetable raw materials of a natural origin which costs times cheaper and does not demand difficult technological process of its preparation.

Presentation of basic material of the research. Analytical studies confirm that the development of technologies for emulsion sauces such as mayonnaise is carried out mainly in the direction of extended shelf life and improving the consistency of sauces, which usually leads to an increase in the cost of the finished product. Therefore, new technologies of mayonnaise sauces are relevant, which will reduce the cost of their production through the introduction of non-traditional vegetable raw materials.

It is well known that non-traditional plant raw materials have significant advantages over synthetic drugs, in particular it contains a natural complex of biologically active substances, macro- and micronutrients in the most accessible and digestible form.

Due to this, the use of vegetable raw materials for sauces and products of its processing becomes more promising. The presence of dietary fiber, organic acids, phenolic compounds, vitamins and minerals in this raw material not only gives it high biological value, but also causes it to show high functional and technological properties and, as a consequence, allows to influence the course of technological processes, quality of semi-finished products and finished products [12].

The introduction of vegetable raw materials in the manufacture of sauces can be carried out in the form of pastes, purees, juices, powders (including non-traditional types of flour) or combinations thereof.

Enriching ingredients include cereal flour, flax, nuts, berries, algae, as well as little-known but promising, non-traditional and wild types of raw materials and products of its processing. Limited use of such raw materials is associated only with the geographical location of its germination and in some cases the difficulty of collecting.

The technology of chocolate-nut emulsion was developed in the research [13]. The author proposes to use a mixture of aqueous extract of root of Saponaria and laminall as an emulsifier, preservative and stabilizer as a filler – pine nut kernels, milk powder, cocoa powder, vanillin, cinnamon and deodorized soybean oil.

Another innovative type of sauce products are sweet and spicy pumpkin sauces, which can be considered analogues of ketchups, which have gained wide popularity among the population of the former Soviet Union. In the developed recipe of these sauces the content of tomatoes is replaced by pumpkin, which is considered a more dietary product from the point of view of nutritionists [14].

A special place belongs to the expansion of the range of mayonnaise, which is associated with the ease of varying the flavour profile of the product, the introduction into the formulation of various additives with certain functional and physiological properties and the ability to replace traditional ingredients (for example, an emulsifying emulsion ingredient, berry pectin-containing raw materials) [15].

The use of raspberry puree (10%) in the mayonnaise sauce can significantly increase the resistance of the product to oxidation without preservative and enrich the mayonnaise product with biologically active substances of plant origin [16].

Scientists are working on optimizing the nutritional value of sauce products and improving the nutrition structure of the population of Ukraine through the use of cereal flour [17]. It is proved that cereal flour, including pearl and oatmeal, in sufficient quantities contains higher polysaccharides – fiber, hemicellulose, mucous and pectin substances, which can play the role of functional substances in the technology of emulsion-type sauces. Recipes for snack sauces based on oatmeal and pearl barley flour were developed, their organoleptic and physicochemical parameters were studied, which confirmed their compliance with standard requirements for similar products.

The technology of functional emulsion-type sauces with increased nutritional value has been improved by adding fucus and wakame seaweed. It is established that the use of algae additives in the technology of sauces such as "mayonnaise" not only increases the nutritional and energy value, but also improves the organoleptic characteristics of sauces [18].

A formulation of natural mayonnaise product «Omega» has been developed, which has increased biological value due to the use of kelp gel as a stabilizer, which naturally contains a significant amount of minerals. Optimized fatty acid composition in the ratio of polyunsaturated fatty acids Omega-6 and Omega-3 is achieved by using in the technology of mayonnaise soybean and linseed oils to replace traditional sunflower [19].

The technology of sweet and sour sauces of high biological value was proposed by the authors [20]. Along with the use of algae as the main source of iodine, the authors add wild raw materials as a source of biologically active substances. Hydrated algae in the following concentrations are offered as iodine-containing additives: Laminaria – 8%, fucus – 5% and Undaria pinnatifida – 3%.

Some scientists around the world are conducting research aimed at developing new types of sauces based on mayonnaise through the introduction of natural ingredients such as flax seeds [21], and a combination of flax seeds and fucus [22].

A distinctive feature of the development of technology of sea buckthorn sauce emulsion type is the replacement of structure-forming agents with apples with sea buckthorn and the use of ultrasonic treatment by ensuring the microbiological purity of the product based on yogurt. The fruits of sea buckthorn and apples were mixed in a ratio of 0.8: 0.2, subjected to heat treatment at a temperature of 85-90°C, then by squeezing obtained sea buckthorn-apple juice. The shrot that left after wiping was used as an additive in a yogurt-based sauce. To do this, it was dried, crushed, then added to yogurt mixed with mustard powder and lemon juice in the ratio (to the weight of yogurt) 3: 2: 2, respectively [23].

The generalization of the analysis of information sources allows us to note that the use in the technology of production of vegetable sauces and products of its processing allows to solve several issues simultaneously. First, it provides a comprehensive enrichment of physiologically useful nutrients in a bioavailable form. Secondly, certain features of the chemical composition of such raw materials determine the manifestation of their functional and technological properties. This has a positive effect on the structural and mechanical characteristics of the finished sauces, allows you to adjust the prescription composition of products (in particular, reduce the content of raw materials with high cost (egg products) or low biological value), use natural additives containing pectins, alginates and other non-starch polysaccharides, to prevent oxidation of the lipid complex during storage (additives with a high content of polyphenolic compounds), etc.

Also, it can be noted that the mayonnaise market is gaining popularity among consumers, so in 2018, starting in September, there was a seasonal increase in mayonnaise production. Production of mayonnaise by large and medium-sized enterprises in Ukraine has returned to its maximum level since the beginning of 2018 and amounted to 13.9 thousand tons. The seasonal growth of emulsion production is also influenced by the expansion of the range, due to mayonnaise-based sauces and the work of marketers on the product type.

A certain niche in the production of emulsion products is occupied by the products of processing of any vegetable raw materials, which also due to its addition will expand the range of products based on mayonnaise.

Conclusions. One of the most important technological aspects of the preparation of emulsion sauces, after optimizing the fatty acid composition, is to ensure the stability of the consistency, which is usually solved by adding polysaccharides: pectin, starch, hemicellulose, etc. Based on the analysis of literature data, it is established that non-traditional vegetable raw materials contain certain functional properties that can be used as structure-forming agents in sauce technology. In addition, it is a source of antioxidants, which is important in the diet of the population.

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Рецензія/Peer review : 11.5.2020 р.

Надрукована/Printed : 10.6.2020 р.
Прорецензовано редакційною колегією