**UDC 637.523**

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***The use of natural food additives in the production of sausage products***

***Abstract.*** *Currently, without food additives, even the most useful products seem tasteless and faded. However, the presence of additives in the product does not mean that it will be harmful to health. Of course, some dietary supplements are safe, but others can cause a number of diseases. It should be remembered that the amount of supplements that enter our body is also of great importance. After all, if the daily diet consists of products with numerous synthetic additives, then even if the permissible amount of each of them in the product is observed, their total amount can significantly go beyond the safe limits.*

*Therefore, this article discusses natural food additives and provides a justification for their use in the production of sausage products as an alternative to various chemical food additives that can have a negative impact on the human body. The purpose of the article is to develop a technological scheme for the production of sausage products, recipes and the use of natural additives in the production of products, such as margarine, blueberries. Taking into account the composition and properties of the studied plant additives, the formulation of a new type of sausage product with an optimal ratio of ingredients for its production was calculated. When studying the characteristics of the raw materials used, it was found that natural food additives do not harm human health.*

*During the experiment, a new type of sausage product was obtained that meets the requirements that were defined for a new type of sausage product. Namely, the complete elimination of chemical food additives from the composition, as well as the organoleptic properties of the finished product are not inferior to analogues offered to the consumer on the market and the nutritional properties of the finished product have been improved by the introduction of natural ingredients such as rosemary and blueberries. Based on the obtained research results, it is recommended to introduce the developed recipe and technology for preparing sausage products into production.*

***Keywords:*** *chemical food additives, sausage product, rosemary, blueberries.*

**Introduction.** Today, there is a full development of the food industry, it is characterized by mechanization and automation of production and transport processes, the use of artificial cold and vacuum technology, the latest physical methods, chemical and biological preparations to accelerate technological processes, a huge variety of new products. New ways of long-term preservation of products in hermetic airtight containers are promising. It is possible to deliver almost any product of the industry to any point of the planet. But the main problem for the consumer is that today's food industry is moving by leaps and bounds in the application and addition of chemical food additives to food: preservatives, flavors, dyes, stabilizers, antioxidants and substitutes for raw materials. [1]

To correctly answer the question of how to treat the use of food with food additives, it is necessary to understand and weigh the main disadvantages and advantages of using them. Advantages – the product is better preserved, has an attractive appearance. Disadvantages – the human body wears out, processing various chemicals, simply put – it is harmful to health. And with certain doses of use-it becomes already dangerous.

Everyone has their own attitude to their health and their own priorities in life. Many people have come to terms with the daily use of products with additives, and many, on the contrary, consciously refuse almost everything in the store. But the fact that no one wants to get poisoned from an overdose of various chemicals or starve to death-that's for sure. Therefore, the main advice is to carefully study the composition indicated on the label of food products and know the measure of their consumption.

It is also impossible to believe blindly that the label was written with the truth. Manufacturers often use additives literally "by eye", which can lead to the production of a product with a dangerously higher concentration. It also happens that the manufacturer intentionally exceeds the norm in order to hide the shortcomings of the product (stale, poor quality of raw materials) and increase the yield of the finished product.

The food additives added to many foods (usually designated by the E code) are predominantly harmful to the body. It is worth noting that the use of products with E-supplements is not too harmful to the body with moderate consumption (for example, several times a month). Dangerous is the situation when a person consumes products with a large number of food additives daily or even several times a day when using various products. Now there are several hundred food additives with the code E (from E100 to E1521).

**Materials and methods.** Guided by all of the above, it was decided to develop a product containing only natural ingredients. As a new product, we chose a semi-smoked sausage product with the addition of rosemary and blueberries. The technological scheme of production of this type of sausage product includes standard procedures for the production of semi-smoked sausages:

- reception of raw materials;

- defrosting of frozen raw materials, temperature +20 ±2 ° C, for 18-24 hours;

- cleaning of meat half-carcasses;

- cutting meat half-carcasses into cuts;

- deboning of meat cuts;

- veneering of meat and dividing it into 3 varieties;

- grinding of meat on a top, the diameter of the grate is 16-25 millimeters (in meal);

- mixing the minced meat in a mince grinder with salting ingredients, for 2-3 minutes;

- aging of meat in salt, at a temperature of +2 + 4 ° C, for 24-48 hours;

- grinding of meat on a top, the diameter of the grate is 2-3; 6-8; 8-12 millimeters, depending on the name of the sausage;

- preparation of lard and its grinding, it should be cooled to a temperature of +2 + 4 ° C or frozen to 0 -3 ° C;

- preparation of minced meat in a minced meat grinder in accordance with the recipe for 8-10 minutes;

- preparation of the shell;

- filling the shell with minced meat on hydraulic syringes, at a pressure that ensures the density of the loaf;

- binding loaves with twine or thread, applying paper clips to the ends of the loaves; [2]

- precipitation, at a temperature of +4 + 6 ° C, for 1-2 days;

- heat treatment in combined chambers or continuous thermal units;

- drying and roasting, at a temperature of 90-100 ° C, for 40-80 minutes, until the temperature in the loaf is 70-72 ° C, and 15-20 minutes before the end of roasting, the humidity is increased from 50 to 55%;

- smoking, at a temperature of 40-45 ° C, for 6-8 hours, humidity 60-65%;

- drying, at a temperature of 10-12 ° C, for 1-2 days, relative humidity 75-78%.;

- quality control of finished products;

- packaging, labeling, transportation and storage. [3]

In the recipe of the new type of product, additional components were added, such as dry ground rosemary and dried blueberries crushed.

Rosemary is an evergreen shrub with thin needle-like leaves and a pleasant aroma. Rosemary flowers and leaves are used as a spice in cooking. The fresh, slightly bitter leaves exude a clean and bright fragrance, reminiscent of a complex mixture of camphor, eucalyptus, pine and lemon. Rosemary is part of the classic French spicy mixtures of "herbs of Provence" and "bouquet of garni", on its basis a fragrant vinegar is prepared. Rosemary leaves are perfectly combined with all types of meat. It is widely used in marinating pork, lamb and rabbit meat to discourage the specific, characteristic smell of these types of meat and give it a peculiar "forest" flavor of game. It is very important that rosemary does not lose its flavor during prolonged heat treatment, so it can be added when frying, stewing or baking products. The use of rosemary in food helps to increase the secretion of gastric juice, improve digestion. Analyzing the results of clinical studies, it was revealed that the water infusion of the plant increases the contraction of the heart, briefly increases blood pressure, has a choleretic and tonic effect, relieves stress and nervous tension. The positive effect of rosemary water infusion (mixed with lavender) on patients in the post-stroke period was also determined, due to its property to improve brain circulation, memory and vision. [4]

Rosemary helps with colds: its volatile substances are able to purify the air of the room from 80 % of the microbes in it. It copes well with such harmful microorganisms as staphylococcus, streptococcus, escherichia coli and yeast fungi. Rosemary leaves and annual shoots were used in folk medicine inside for amenorrhea, as an astringent, tonic for impotence; sedative - for nervous disorders in the menopausal period; analgesic - for pain in the heart and stomach colic and externally - for neuritis, thrombophlebitis, rheumatism, mumps, whites, as a wound-healing agent. [5]

Nutritional value per 100 grams of edible part:

- calorie content 331 kcal;

- proteins of 4.88 g;

- fat 15.22 g;

- carbohydrates 64.06 g;

- dietary fiber and 42.6 g;

- ash of 6.53 g;

- water of 9.31 g;

- saturated fatty acids 7,371 g.

Vitamins per 100 grams of the edible part:

- vitamin A 156 mcg;

- Vitamin B1 (thiamine) 0.514 mg;

- Vitamin B2 (riboflavin) 0.428 mg;

- Vitamin B6 (pyridoxine) 1.74 mg;

- Vitamin B9 (folic) 307 mcg;

Vitamin C 61.2 mg.

- vitamin PP (Niacin-bound chromium equivalent)1 mg

Macronutrients per 100 grams of edible part:

- calcium 1280 mg;

- Magnesium 220 mg;

- sodium 50 mg;

- potassium 955 mg;

- phosphorus 70 mg.

Trace elements per 100 grams of edible part:

- Iron 29.25 mg;

- Zinc 3.23 mg;

- Copper 550 mcg;

- Manganese 1.867 mg;

- Selenium and 4.6 mcg. [6]

Blueberry-a shrub up to 30 cm high, having spherical fruits, at the top with the rest of the calyx in the form of a ring border, in the center of a dimple. The flesh of the berries is black and purple in color. The taste is sweet and astringent. Blueberry berries in the form of a decoction, jelly are used as an astringent for acute and chronic disorders of the gastrointestinal tract, accompanied by diarrhea, dyspepsia associated with increased fermentation and putrefaction processes, colitis, enterocolitis, dysentery. Blueberry decoctions are used topically for stomatitis and gingivitis as an astringent and antiseptic.

Blueberry berries are used as a dietary and therapeutic remedy for cystitis, mild forms of diabetes mellitus. The leaves and shoots used for diabetes, because they contained glycoside nemertean has the ability to lower the levels of glucose in the blood.

Berries are consumed fresh, dried and in the form of infusions. The infusion is used for gastrointestinal diseases, diabetes, used for inflammatory diseases of the oral cavity and pharynx for rinsing. Blueberry berries are widely used in food as a delicacy, for making jams, compotes and jelly. It is used for scurvy, hypovitaminosis. The positive effect of blueberries (fresh, dried, in the form of decoction, infusion, juice, etc.) on visual acuity was noted. Externally, fresh decoctions of blueberries are used in the treatment of ulcers and burns.

Blueberries contain up to 12% tannins of the pyrocatechin group; up to 7% organic acids, including citric, malic, succinic, quinic, benzoic, lactic, oxalic; up to 30% sugar, 60% ascorbic acid, 0.75-1.6% carotene, 0.04% vitamins of group B. Blueberries contain 6% sodium, 51% potassium, 16% calcium, 6% magnesium, 13% phosphorus, 7% iron, manganese. Seeds contain up to 31% of fat oil, up to 18% of protein. Also found in large quantities in blueberry berries, sodium benzoate has revealed to humans its preservative effect, which is used in the food industry. The preservative properties of the substance are based on the suppression of the reproduction of microscopic organisms, prevents the development of moldy fungi and yeast. The content of sodium benzoate was the main reason for the introduction of blueberries in a new type of sausage product.

Nutritional value per 100 grams of edible part:

- calorie content 44 kcal;

- protein 1.1 g;

- fat 0.6 g;

- carbs and 7.6 g;

- dietary fiber 3.1 g;

- organic acids 1.2 g;

- water 86 g;

- mono - and disaccharides 7.6 g;

- ash 0,4 g.

Vitamins per 100 grams of the edible part:

- vitamin PP 0.3 mg;

- Vitamin B1 (thiamine) 0.01 mg;

- Vitamin B2 (riboflavin) 0.02 mg;

- Vitamin C 10 mg;

- Vitamin E (TE) 1.4 mg;

- vitamin PP (Niacin-bound chromium equivalent) 0.4 mg.

Macronutrientsin 100 grams of the edible part:

- calcium 16 mg;

- Magnesium 6 mg;

- sodium 6 mg;

- potassium 51 mg;

- phosphorus 13 mg.

Trace elements per 100 grams of the edible part:

- Iron 0.7 mg.

**Results**. Taking into account the composition and properties of the studied plant additives, the calculation of the recipe with the optimal ratio of ingredients for the production of a new type of sausage product was carried out, which is presented in Table 1.

Table 1 – Recipe for a new type of sausage product

|  |  |  |
| --- | --- | --- |
| № | Name of raw materials, spices and materials | Quantity, % |
| 1 | Pork ham prepared | 63,45 |
| 2 | Fat | 19,03 |
| 3 | Beetroot extract, liquid | 12,69 |
| 4 | Garlic, fresh, peeled, minced | 2,22 |
| 5 | Dried blueberries, crushed | 1,27 |
| 6 | Table salt, food grade | 0,64 |
| 7 | Black pepper fragrant ground | 0,38 |
| 8 | Ground red sweet pepper | 0,16 |
| 9 | Dry ground rosemary | 0,16 |

**Discussion**. During the experiment, a product was obtained that meets the requirements that were defined for a new type of sausage product. Namely, the complete elimination of chemical food additives from the composition, as well as the organoleptic properties of the finished product are not inferior to analogues offered to the consumer on the market and the nutritional properties of the finished product have been improved by the introduction of natural ingredients such as rosemary and blueberries.

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***Шұжық өнімдерін өндіруде табиғи тағамдық қоспаларды қолдану***

*Қазіргі уақытта тағамдық қоспаларсыз, тіпті ең пайдалы тағамдар дәмсіз және түссіз болып көрінеді. Алайда, өнімде қоспалардың болуы денсаулыққа зиян тигізетінін білдірмейді. Әрине, кейбір тағамдық қоспалар қауіпсіз, бірақ басқалары бірқатар ауруларды тудыруы мүмкін. Есте маңызы зор, сондай-ақ саны қалған біздің ағзамыз қоспалар. Шынында да, егер күнделікті диета көптеген синтетикалық қоспалары бар өнімдерден тұрса, онда олардың әрқайсысының рұқсат етілген мөлшерін сақтай отырып, олардың жалпы саны қауіпсіз шектерден едәуір асып кетуі мүмкін.*

*Сондықтан, бұл мақалада табиғи тағамдық қоспалар қарастырылады және адам ағзасына теріс әсер етуі мүмкін әртүрлі химиялық тағамдық қоспаларға балама ретінде шұжық өндірісінде оларды қолдану негіздемесі келтірілген. Мақаланың мақсаты-шұжық өнімдерін өндірудің технологиялық схемасын, Рецептураны және табиғи қоспаларды, мысалы, розмарин, көкжидек сияқты өнімдерді өндіруде қолдану. Зерттелетін өсімдік қоспаларының құрамы мен қасиеттерін ескере отырып, оны өндіруге арналған ингредиенттердің оңтайлы қатынасы бар шұжықтың жаңа түрінің рецепті есептелді. Қолданылатын шикізаттың сипаттамаларын зерделеу кезінде табиғи тағамдық қоспалар адам денсаулығына зиян тигізбейтінін анықтады.*

*Тәжірибе барысында шұжық өнімінің жаңа түрі анықталған талаптарға сәйкес келетін шұжық өнімінің жаңа түрі алынды. Атап айтқанда, композициядан Химиялық тағамдық қоспаларды толығымен алып тастау, сондай-ақ дайын өнімнің органолептикалық қасиеттері нарықта тұтынушыға ұсынылатын аналогтардан кем түспейді және розмарин мен көкжидек сияқты табиғи компоненттерді енгізу арқылы дайын өнімнің тағамдық қасиеттері жақсарды. Алынған зерттеу нәтижелерінің негізінде шұжық өнімдерін өндіріске дайындаудың әзірленген рецептурасы мен технологиясын енгізу ұсынылады.*

***Түйін сөздер****: химиялық тағамдық қоспалар, шұжық өнімдері, розмарин, көкжидек.*

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**Применение натуральных пищевых добавок в производстве колбасных изделий**

*В настоящее время без пищевых добавок даже самые полезные продукты кажутся безвкусными и блёклыми. Однако, наличие добавок в продукте вовсе не означает, что он принесет вред здоровью. Конечно, некоторые пищевые добавки безопасны, а вот другие способны вызвать целый ряд заболеваний. Следует помнить, что большое значение имеет также количество попавших в наш организм добавок. Ведь, если суточный рацион питания состоит из продуктов с многочисленными синтетическими добавками, то даже при соблюдении допустимого количества каждого из них в продукте общее их количество может существенно выходить за безопасные грани.*

*Поэтому в данной статье рассмотрены натуральные пищевые добавки и дано обоснование их применения при производстве колбасных изделий как альтернативы различным химическим пищевым добавкам, которые могут оказывать негативное влияние на организм человека. Целью статьи является разработка технологической схемы производства колбасных изделий, рецептуры и применение натуральных добавок при производстве продукции, таких как розмарин, черника. С учетом состава и свойства исследуемых растительных добавок, был проведен расчет рецептуры нового вида колбасного изделия с оптимальным соотношением ингредиентов для его производства. При изучении характеристики применяемого сырья, выяснили, что натуральные пищевые добавки не вредят здоровью человека.*

*В ходе эксперимента был получен новый вид колбасного продукта, соответствующий тем требованиям, которые были определены для нового вида колбасного изделия. А именно, полное исключение химических пищевых добавок из состава, также органолептические свойства готового продукта не уступают аналогам, предлагаемым потребителю на рынке и питательные свойства готового продукта были улучшены, за счет внесения таких натуральных компонентов, как розмарин и ягоды черники. На основании полученных результатов исследований рекомендуется внедрить разработанную рецептуру и технологию приготовления колбасных изделий в производство.*

***Ключевые слова:*** *химические пищевые добавки, колбасный продукт, розмарин, черника.*