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TECHNOLOGY OF SMOOTHIE BASED ON WALNUT NUT BEVERAGE WITH ADDITION OF BANANA AND COCOA POWDER

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Abstract. *This article substantiates the choice of raw materials of plant origin for the preparation of a smoothie based on a beverage from walnut kernels with the addition of banana and cocoa powder.*

The organoleptic parameters of the smoothies samples at different ratios of ingredients taking into account the weighting factors were studied and the comparative characteristics of the chemical composition of the selected samples were carried out. According to the results of research, a recipe and technology for the production of a smoothie based on a beverage from walnut kernels with the addition of banana and cocoa powder was developed, which is presented in the form of a basic technological scheme indicating all the parameters..

Key words: *beverage, walnut, smoothie, banana, cocoa powder, technology, plant beverage*

Introduction.

Plant-based foods should predominate in a person's daily diet. The right diet should contain a moderate amount of fat (not more than 25...30% of energy value), protein (1 g/kg of human body) and carbohydrates (mostly complex carbohydrates). The diet should include a sufficient amount of different fresh vegetables and fruits. This will provide an alkaline orientation of the population's nutrition. Studies of the structure of nutrition [1] have shown a significant reduction in protein intake, and the body's need for energy is met by increasing the consumption of carbohydrates and fats. Therefore, it is important to increase the number of foods with high biological value, the recipes of which would be based on the provisions of the theory of balanced nutrition, as well as would take into account the economic potential of the consumer [2]. Particular attention should be paid to the protein content in the diet of supporters of alternative foods. Compensation for animal protein in the diet needs sections of the population who, according to personal beliefs, do not eat animal products, including vegetarians and vegans.

No less important prerequisite for expanding the range of protein beverages of plant origin is intolerance or allergy to the components of traditional for Ukraine protein beverages of animal origin, including dairy beverages.

The aim of the article is to scientifically substantiate and develop the recipe and technology of a smoothie based on a beverage made from walnut kernels with the addition of banana and cocoa powder.

Presenting main material.

Smoothies are a thick drink, cocktail, mousse, prepared by whipping in a blender to a state of puree of natural ingredients - fresh or fresh-frozen fruits, vegetables, berries, milk, yogurt, kefir, ice cream, cream. It is well absorbed by the

body, which allows it to be classified as light and dietary dishes [3]. Due to the convenience and time savings, this is a promising direction in the modern restaurant business.

Ingredients were selected to balance the nutritional value of the beverage to create a smoothie based on beverage from walnut kernels. Only ingredients of plant origin were studied, special attention was paid to their protein content. The organoleptic properties of each investigated ingredient and their compatibility with the organoleptic properties of the beverage from walnut kernels and other ingredients were also taken into account [4].

Today, a very popular fruit is a banana, because its consumption can saturate the body with nutrients and satisfy hunger. The chemical composition of ripe bananas is as follows: water content - 75%, sugar - 20%, starch - 1.6%, nitrogenous substances - 1.2%, pectic substances - 0.5%, organic acids - 0.4%, fiber - 0.6%. Fruits contain large amounts of vitamins E, C, B_1, B_2, B_6, provitamins A and PP. Bananas also contain valuable minerals: potassium, sodium, magnesium, phosphorus, calcium, iron, manganese and copper. One banana covers the daily need of the human body for potassium and magnesium [5].

The next ingredient was selected cocoa powder – it is a finely ground product made from cocoa oilcake, which is used for making beverages, in the manufacture of confectionery and some other products. It consists of (g/100 g): proteins - 24.2, fats - 11… 16, fiber - 15.5, starch and other polysaccharides - 24.4, ash - 6.3, organic acids - 1.0 [6].

That is why these ingredients were chosen to develop smoothie recipes. The amount of banana added to the beverage was 12… .17% by weight of the beverage, cocoa powder - 3… 6%.

To begin with, 15 smoothies formulations with different ratios of selected ingredients were developed. In the obtained 15 samples, smoothies based on the beverage from walnut kernels with the addition of banana and cocoa powder were studied by the method of organoleptic evaluation on a five-point scale, taking into account the weighting factor.

Among the studied samples of the smoothies based on the beverage from walnut kernels with the addition of banana and cocoa powder, three samples were selected with the highest estimates of organoleptic properties in the following ratios - beverage from walnut kernels: banana: cocoa powder - 80: 15: 5 (sample 3), 80: 12: 3 (sample 8), 80: 16: 4 (sample 13).

In order to develop an optimal formulation, a comparison of the chemical composition of the three selected samples was performed. According to the results of research, sample 3 has a higher content of proteins, vitamin B_5, B_9, E, PP, and all studied trace elements, compared with samples 8 and 13. Among the presented samples, the best chemical composition is sample 3.

The conducted researches give the grounds to choose a ingredients ratio of a sample 3 for development of a compounding. The recipe of a smoothie on the basis of drink from kernels of a walnut with addition of a banana and cocoa powder is presented in table 1, and the technological scheme of production – figure1.

Table 1

The recipe of a smoothie based on a beverage from walnut kernels with the addition of banana and cocoa powder

Raw materials	Consumption of raw materials, kg per 10 kg of beverage from walnut kernels	
	Gross	Net
Mechanical and culinary processing of raw materials		
Beverage from walnut kernels	8,5	8,5
Banana	2,5	1,21
Cocoa powder	0,30	0,30
Losses	1,29	
Grinding and homogenization at 900W		
Smoothies based on a beverage made from walnut kernels with the addition of banana and cocoa powder.	10,1	10,0
Moisturized cocoa powder	1,25	-
Banana puree	1,21	-
Losses	2,46	
Total losses of raw materials	3,75	

For the production of the beverage use peeled walnut kernels, which are soaked in purified drinking water in a ratio of water to raw materials 1: 1. For soaking use water at a temperature of 20ºC, the soaking process lasts 5 hours. As a result of soaking the kernels of nuts are soaked.

The next stage is the separation of raw materials from water. After soaking, the water is disposed of or sent for purification with its repeated use. After soaking, the kernels are sent for grinding to obtain a paste-like mass, which enters the extraction. The extractant is a 0.5% aqueous solution of sodium chloride. The ratio of extractant to weight of raw materials - 8: 1. The extraction process takes place at a temperature of 55… 60ºC for 60 min with constant stirring. After extraction, the extract in the form of a fine suspension is separated from insoluble residues by filtration [7]. The resulting beverage has a milky color with a light brown tinge, a pronounced nutty odor and a liquid consistency.

The next step is to beat all the components. The cocoa powder is pre-screened and the banana is peeled. The prepared ingredients and the beverage from the walnut kernels in the recipe ratio are placed in a blender with subsequent grinding for 60… 90 s at a speed of 1000 rpm.

Conclusions.

According to the analytical review of domestic and foreign publications, it was found that the population's consumption of protein is deficient in both quantitative and qualitative terms. Among the possible ways to solve this problem, the main and decisive place belongs to attracting a reserve of proteins of plant origin through the use of non-traditional sources of plant protein. That is why the smoothie was developed on the basis of only plant raw materials

Taking into account the results of organoleptic studies, comparative characteristics of the chemical composition and taking into account the harmonious combination of selected ingredients it was developed a recipe for a smoothie based on walnut kernels beverage with banana and cocoa powder in the ratio - beverage from walnut kernels: banana: cocoa powder - 80: 15: 5.

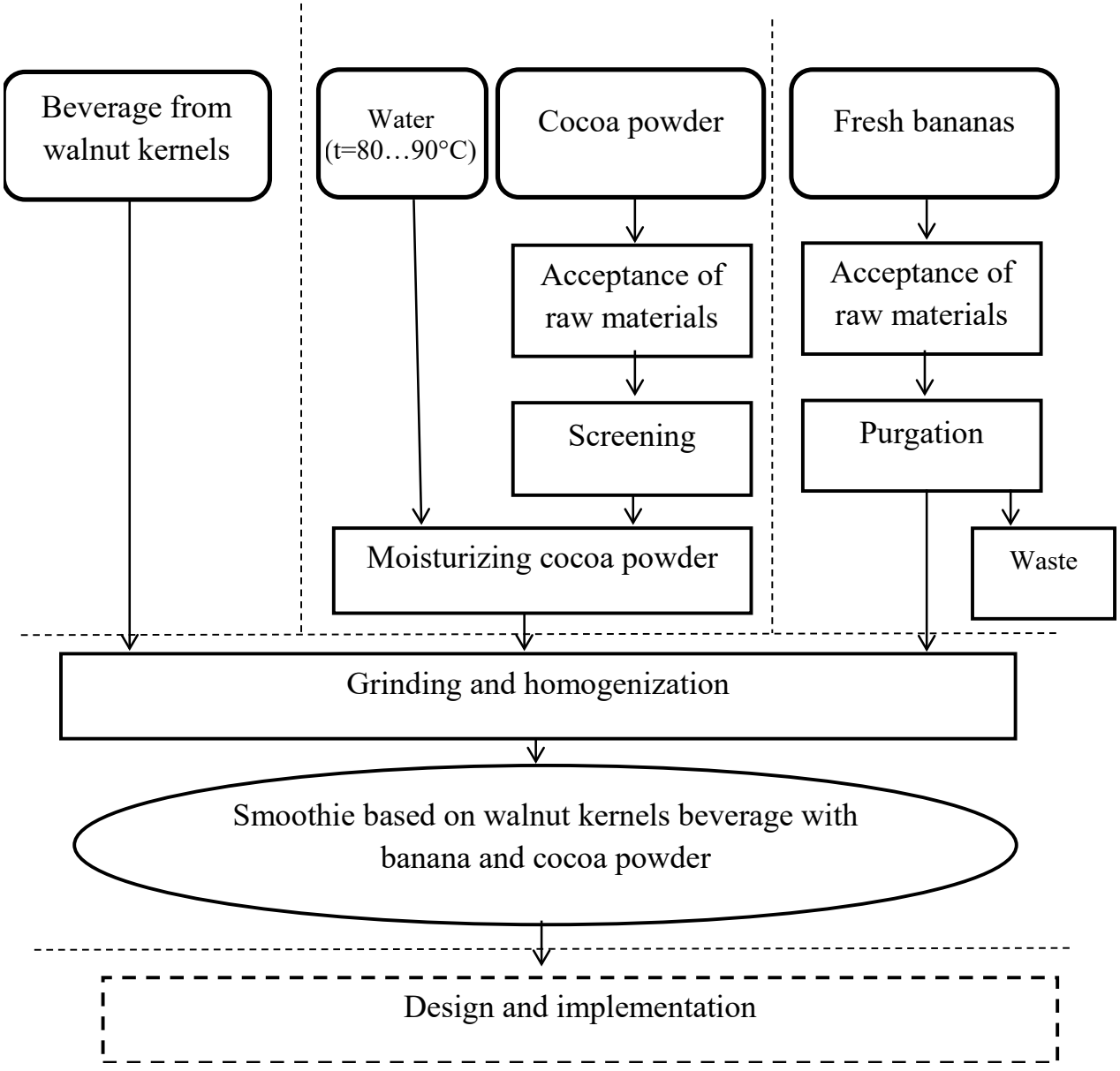

Figure 1 - Technological scheme of making a smoothie based on a beverage from walnut kernels with the addition of banana and cocoa powder

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