

THE STUDY OF TECHNOLOGICAL PARAMETERS FOR TREATING PECTIN-CONTAINING RAW MATERIALS IN THE TECHNOLOGY OF MILK-VEGETABLE MINCES

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The principal provisions of the modern theory of creation of combined products have been developed by many researchers. Discussions and detailed literature reviews were also dedicated to this issue. It was proven that the use of vegetable raw materials in the technology of extrusion products, soft cheese and special food products increases the content of water-soluble vitamins, mineral substances, improving the taste and consumer properties.

Combined with vegetable or animal raw material, it is such a milk product in which the share of the milk base is not less than 50%; the share of the vegetable component in the combined product must not exceed 30%.

Introduction of vegetable raw materials to the composition of milk-vegetable minces in the form of puree provides the possibility to give mincing products necessary consistence and to adjust their structural-mechanical characteristics. That is why the use of vegetable raw materials in the technology of mil-vegetable minces should be considered from the perspective of implementation of the properties of pectin substances, namely the possibility to increase the viscosity of dispersion medium and to act as a structure stabilizer.

Of significant theoretical and practical interest is the development of technologies of the activation of pectin contained in vegetable raw materials by alkaline, acid or enzymatic hydrolysis of protopectin and the transfer of pectin to active state.

In order to increase the amount of pectin substances in vegetable raw materials, a new method of preparation of carrot and pumpkin puree is proposed. The peculiarity of their obtaining is in the process of hydrolytic cleavage of protopectin of plant tissue. In the process of hydrolysis, the amount of low esterified pectin increases by almost 3 times. In addition, vegetable purees have an increased amount of fiber, beta carotene.

However, the above described methods of obtaining vegetable puree require correction in accordance with the selected items of the study. That is

why the development of method for obtaining puree from vegetables, that provides maximum transition of pectin into active state is the dominant direction for further research.

Technological parameters and the modes of obtaining puree from vegetables should be considered both from the position of implementation of properties of pectin substances, namely, the ability to increase viscosity of the dispersion medium and to act as a stabilizer of the structure, and from the position of maximum preservation of low molecular biologically active substantial and other nutrients.

For the scientific substantiation of technological parameters and modes of obtaining puree from carrot, variety Chantenay; pumpkin, variety Gilea; and zucchini, variety Zolotinka, with the purpose of their further use in the technology of milk-vegetable minces, we performed a series of experimental research.

The following parameters of correcting the process of obtaining puree from vegetables were selected: values of indicators of temperature and duration of TT of vegetables, temperature of shredding the vegetables, temperature and duration of TT of puree, pH of the medium.

Based on the conducted analysis of the methods of production of puree and pastes from vegetables, we established that the hydrolysis of protopectin most intensively occurs in the acidic medium. Correction of pH is possible by the introduction of food acids: citric acid or its mixture with ascorbic acid, phosphoric acid, etc. The most popular is the citric acid that is able to shift pH to the acidic side and additionally allows reducing the loss of β -carotene in the product, which is due to its oxidation. That is why the regulation of pH in the chosen area was carried out by the introduction of citric acid. The results obtained indicate that the change in pH significantly affects the content of SP in the puree from vegetables. Results of the research have confirmed that the maximum amount of soluble pectin in puree is accumulated at the pH values of 3.0...3.4.

We substantiated technological parameters for treatment of vegetable raw materials to ensure the realization of their target properties as a structure-forming agent in the technology of milk-vegetable minces: temperature of TT of vegetables – 110 ± 2 °C, duration of TT of vegetables (20...25)·60 s for carrot and pumpkin, and (15...20)·60 s – for zucchini.

The expediency of applying acid hydrolysis using citric acid as a pH regulator was substantiated.

We designed a technological scheme of obtaining puree from carrot or pumpkin or zucchini: temperature of the shredding of vegetables – 80 ± 5 °C, temperature of TT of puree – 75 ± 5 °C, duration of TT – (6...7)·60 s and pH of the medium – 3.0...3.4.