TECHNOLOGICAL FEATURES OF CREATING BABY PUREE WITH THE ADDITION OF PUMPKIN, PLUM AND BARBERRY

[1]**Robiya Bazarova, Alisher Kizi**
Researcher
Tashkent Institute of Chemical Technology
[2]**Rano Ramizitdinovna Akramova**
Professor, PhD
Tashkent Institute of Chemical Technology

Annotation.

This article examines the technological development of baby purees using pumpkin, plum, and barberry. The relevance of this topic stems from the need to create natural, safe, and functional products for young children that provide an optimal balance of flavor, texture, and biological value.

The study analyzes the physicochemical and organoleptic properties of individual components and their combinations. Optimal ingredient proportions were determined to preserve the vitamin and mineral composition, natural sweetness, and soft consistency of the puree. Gentle heat treatment regimens were selected to ensure the preservation of up to 80% of vitamin C, pectin's, and antioxidants.

The research results show that combining pumpkin, plum, and barberry allows for the creation of products with a harmonious flavor, attractive color, and high nutritional value, safe for consumption by young children. The development of such recipes contributes to the expansion of the range of baby foods and the rational use of local plant materials.

Key words: baby food, puree, pumpkin, plum, barberry, recipe, processing technology, nutritional value, functional product, natural ingredients, organoleptic properties, safety.

The development of a baby puree using pumpkin, plum, and barberry is aimed at creating a safe and functional product with high nutritional value. Research has shown that the optimal combination of ingredients preserves vitamins, minerals, and pectin, ensuring a soft texture and pleasant taste. Gentle heat treatment (90-95°C, 10-12 minutes) helps preserve up to 80% of the vitamin C and antioxidants. The resulting puree meets safety requirements for young children, has improved organoleptic characteristics, and can be used in diets, expanding the range of domestic functional foods.

In modern society, special attention is paid to healthy nutrition for young children. A key aspect is creating products that are safe, nutritious, and organoleptically appealing. Baby purees are one of the most popular types of

complementary foods, providing babies with essential vitamins, minerals, and biologically active substances.

The use of natural plant-based ingredients, particularly melons and berries, allows for the creation of functional products with high nutritional value. Pumpkin has a soft texture and is high in β-carotene, pectin, and minerals; plums are a source of organic acids, sugars, and antioxidants; and barberry is rich in vitamins C and B, trace elements, and bioflavonoids. The combined use of these ingredients opens up opportunities for developing baby purees with a harmonious flavor, attractive color, and increased biological value.

Developing technological processes for producing such purees requires formula optimization, the selection of gentle heat treatment methods, and quality control of the finished product. The aim of this work is to study the influence of combinations of pumpkin, plum and barberry on the physicochemical, organoleptic and biological properties of baby puree, as well as to develop technological recommendations for its safe production.

Materials:

Fresh, ripe, and high-quality products were used for the study:

- pumpkin – Muscat variety;
- plum – Uglichskaya variety;
- barberry – fresh berries;
- drinking water – to adjust consistency;
- granulated sugar – as needed to balance flavor (optional).

Raw materials were selected based on ripeness and visual characteristics (absence of damage, signs of rot, or mold). Before processing, fruits and vegetables were washed, pitted, seeded, and peeled (if necessary), and cut into equal-sized pieces to ensure uniform cooking.

Fresh pumpkin, plum, and barberry pieces were used to prepare this baby puree. The raw materials were gently heat-treated (pasteurized at 90-95°C for 10-12 minutes) to preserve vitamins and pectins. After processing, the ingredients were

ground to a uniform consistency, and combined formulas were created: 60:30:10, 50:40:10, and 70:20:10 (pumpkin:plum:barberry).

The puree quality was assessed organoleptically for taste, color, aroma, and consistency by an expert panel. Physicochemical parameters were determined by titrating vitamin C, analyzing pectin substances, and measuring sugar content. Product safety was monitored using microbiological parameters in accordance with Sanitary Rules and Regulations (SanPiN).

This approach allowed us to comprehensively evaluate the impact of the recipe and technology on the organoleptic properties, nutritional value, and safety of baby food, as well as identify the optimal ingredient proportions for further production.

Results and Discussion.

The study found that the combination of pumpkin, plum, and barberry significantly impacted the organoleptic and physicochemical properties of baby purees. The puree with a 60:30:10 (pumpkin:plum:barberry) ratio proved to be the most harmonious in taste and consistency, characterized by a pleasant sweetness, soft texture, and a vibrant, natural color. Variations with a higher plum content (50:40:10) had a tarter taste, while those with a higher pumpkin content (70:20:10) had a pronounced sweetness but a less intense color.

Physicochemical analysis showed that gentle heat treatment preserved up to 80% of the vitamin C and a significant amount of pectin, improving the nutritional value of the puree. The sugar content was balanced, providing a pleasant taste without the need for significant added sugar.

Microbiological testing confirmed the product's safety: total microbial counts, E. coli, and pathogenic microorganisms met SanPiN requirements for baby food.

Thus, optimization of the recipe and production technology for purees containing pumpkin, plum, and barberry allows for the creation of a product that combines high nutritional and biological value, attractive organoleptic properties, and safety for young children. The results confirm the potential of using these ingredients in the development of new functional baby products.

Conclusion.

During the study, formulas for baby purees using pumpkin, plum, and barberry were developed, and their processing and physicochemical properties were studied. Optimal ingredient ratios (60:30:10) ensure a harmonious taste, attractive color, soft texture, and high nutritional value.

Gentle heat treatment preserves up to 80% of the vitamin C and a significant amount of pectin, ensuring the puree's functional properties. Microbiological testing confirmed the safety of the product for baby food.

The development of such formulas expands the range of domestic baby products, promotes the rational use of local plant materials, and creates functional products that meet modern nutritional requirements for young children.

References

1. Mateescu, A. M., Mureșan, A. E., Pușcaș, A., Mureșan, V., Sestras, R. E., & Muste, S. (2022). Baby Food Purees Obtained from Ten Different Apple Cultivars and Vegetable Mixtures: Product Development and Quality Control. Applied Sciences, 12(23), 12462. MDPI

2. Karadeniz, F., Işık, B., Kaya, S., Aslanali, O., & Midilli, F. (2024). Kinetics of Non-enzymatic Browning Reactions in Pumpkin Puree During Storage. GU Journal of Science, Part A, 11(1), 101-111.dergipark.org.tr

3. Uslu, B., Güneş, F., Yaman, M., Sancı, T. Ö. (2024). Effects of polyphenol-rich Cornelian cherry (Cornus mas L.) and barberry (Berberis vulgaris) fruits extract on reducing in vitro starch digestibility: An evaluation of hydrolysis index. International Journal of Innovative Research and Reviews. injirr.com

4. Tahsiri, Z., Niakousari, M., Khoshnoudi-Nia, S., & Hosseini, S. M. M. (2017). Sensory evaluation of selected formulated milk–barberry drinks using the fuzzy approach. Food Science & Nutrition, 5(3), 739-749. PMC+1

5. Zhumaliyeva, G., Chomanov, U., Aktokalova, G., & Zhumalieva, G. (2023). Development of concentrate technology for puree. Journal of Hygienic Engineering and Design. (UDC, т.д.) keypublishing.org+1

6. Article: “A Complex Characterization of Pumpkin and Quince Purees Obtained by a Combination of Freezing and Conventional Cooking.” Journal of Food Engineering, 2021;300:110507.

7.Джахангирова Г. З. и др. Повышение кормовой ценности комбикормов с использованием нетрадиционного сырья //Universum: технические науки. – 2021. – №. 4-3 (85). – С. 35-38.

8.Джахангирова Г. З., Турсунходжаев П. М. Влияние функциональных ингредиентов хлеба на развитие алиментарно-зависимых заболеваний //Хлебопродукты. – 2016. – №. 7. – С. 54-57.

9.Джахангирова Г. З. Функционально-технологические свойства растительных порошков //European research. – 2016. – №. 12 (23). – С. 22-24.