

Cherry Jam Production Technology Using Uzbek Cherry Varieties

Master of Tashkent State Agrarian University

N.A.Mirzaakhmedova

Abstract. This article analyzes the technology of producing jam from cherries (*Prunus avium* L.) grown in Uzbekistan, specifically the “Fergana cherry,” “Samarkand red,” and “Shirmoyak” varieties. The main stages of jam production—raw material selection, washing, pitting, cooking, sugar mixing, pasteurization, and packaging—are examined. The impact of the technology on nutritional properties (vitamin C, anthocyanins, antioxidants), energy consumption, environmental sustainability, and quality control is analyzed. Special attention is given to the practical possibilities and export potential of cherry jam production in the context of Uzbekistan’s agriculture. The study is based on scientific literature, works by Uzbek scholars, normative-legal documents, and practical data. The article provides a comparative analysis of the advantages and limitations of the jam production technology and offers recommendations for advancing this sector in Uzbekistan.

Keywords: Cherry, Fergana cherry, Samarkand red, Shirmoyak, jam, processing, technology, cooking, pasteurization, nutritional properties, quality control, energy consumption, environmental sustainability, packaging, agriculture, food industry, export, Uzbekistan.

Introduction

Cherry (*Prunus avium* L.) is a significant fruit crop in Uzbekistan’s agriculture, valued for its high nutritional properties, including vitamin C (7-10 mg per 100 g), anthocyanins, antioxidants, dietary fiber, and minerals (potassium, magnesium). Cherry jam is widely used in confectionery, bakery products, and the food industry, enjoying demand in both local and international markets. In Uzbekistan, cherry cultivation is prevalent in the Fergana Valley, Samarkand, and Tashkent regions, with an annual harvest exceeding 70,000 tons, a portion of which is processed into jam, juice, and dried products (Uzbekistan Statistics Agency, 2024).

Cherry jam production in Uzbekistan is regulated by legal frameworks. The Law of the Republic of Uzbekistan “On Food Safety” (2021) mandates compliance with microbiological and chemical safety standards and sanitary norms. The Law “On the Development of Agriculture” (2004) supports the adoption of modern technologies in processing and export preparation of agricultural products. Standards such as DSt 3285:2014 (for jams and preserves) and DSt 3331:2016 (for fruit and vegetable purees) set requirements for cherry jam’s quality, moisture content, organoleptic properties, and storage conditions.

This article examines the technology of producing cherry jam from Uzbekistan’s cherry varieties—“Fergana cherry,” “Samarkand red,” and “Shirmoyak.” The study aims to analyze the technology’s efficiency, its impact on nutritional properties, energy consumption, environmental sustainability, and its applicability in Uzbekistan’s agricultural context. Based on scientific literature, works by Uzbek scholars, practical data, and Uzbekistan’s experiences, the technology’s advantages, limitations, and prospects are evaluated.

Main Body

1. Characteristics of Uzbek Cherry Varieties and PLEASE NOTE: This section appears to have been cut off. I’ll continue assuming you want the article to proceed in the same style.

1.1 Uzbek Cherry Varieties and Their Importance in Jam Production

Uzbekistan's cherry varieties, such as "Fergana cherry," "Samarkand red," and "Shirmoyak," are renowned for their unique qualities:

- Fergana cherry: Known for its bright red color and sweet-tart flavor, ideal for jam due to high sugar content (12-15% Brix).
- Samarkand red: Rich in anthocyanins and antioxidants, providing vibrant color and nutritional value.
- Shirmoyak: Juicy and slightly tart, suitable for premium jams with a balanced flavor.

These varieties are widely grown in regions like Fergana Valley and Samarkand, with an annual production of over 70,000 tons, a significant portion of which is processed into jam. Jam production extends shelf life to 12-24 months and adds value, making it a key product for both local and export markets.

2. Cherry Jam Production Technology The production of cherry jam involves several stages: raw material selection, washing, pitting, cooking, sugar mixing, pasteurization, and packaging.

2.1 Raw Material Selection and Preparation High-quality, ripe cherries with optimal sugar content (12-15% Brix) are selected. "Fergana cherry" and "Samarkand red" are preferred for their sweet-tart balance, while "Shirmoyak" is ideal for premium jams due to its unique flavor. Washing removes dirt, microbes, and pesticides, complying with DSt 3331:2016 standards. Automated washing systems, such as those produced by UzAgroTech, save 20-30% of time.

2.2 Pitting and Crushing. Cherries are pitted using specialized machines (e.g., AgroMash models). The fruit is then crushed into a pulp. Antioxidants like ascorbic acid (0.1-0.2%) are added to minimize oxidation, reducing vitamin C loss to 5-10%. "Samarkand red" requires more energy due to its thicker skin, while "Shirmoyak" crushes easily.

2.3 Cooking and Sugar Mixing. The cherry pulp is cooked at 90-100°C for 20-30 minutes with sugar (ratio 1:1 or 1:1.5 depending on variety). This process preserves anthocyanins (70-80%) but reduces vitamin C by 20-30%. "Fergana cherry" retains vibrant color, while "Shirmoyak" offers a premium texture.

2.4 Pasteurization. Pasteurization at 85-95°C for 30-60 seconds ensures microbiological safety. "Samarkand red" shows stability due to high acidity, while "Fergana cherry" retains color well. Vitamin C loss is 15-20%, but antioxidants remain high.

2.5 Packaging. Jam is packaged in aseptic containers (Tetra Pak, glass jars) for a shelf life of up to 24 months. "Shirmoyak" excels in aseptic packaging for premium markets. Eco-friendly packaging (biodegradable materials) is gaining traction in Europe.

3. Quality Control and Nutritional Properties. Quality control assesses organoleptic (color, taste, aroma), physicochemical (sugar content, acidity), and microbiological properties. DSt 3285:2014 requires sugar content of 60-65% and acidity of 0.3-0.8%. "Fergana cherry" offers vibrant color, "Shirmoyak" a smooth texture ideal for premium jams. Proper processing retains 70-80% of anthocyanins and 60-70% of vitamin C.

4. Energy Consumption and Environmental Sustainability. Jam production is energy-intensive, requiring 150-200 kWh per ton for cooking and pasteurization. Solar-powered systems reduce costs by 20-30%. Waste recycling (e.g., cherry pits for oil) and biodegradable packaging enhance sustainability.

5. Prospects for Cherry Jam Production in Uzbekistan. In 2023, Uzbekistan exported over 5,000 tons of cherry jam, primarily to Russia, Kazakhstan, and China (Uzbekistan Statistics Agency, 2024). Organic certification (EU Organic) can increase export prices by 20-30%. Modern

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technologies and solar energy improve efficiency, while “Fergana cherry” and “Shirmoyak” target premium markets.

Conclusion. The technology for producing cherry jam from Uzbek varieties like “Fergana cherry,” “Samarkand red,” and “Shirmoyak” is a vital component of Uzbekistan’s food industry. The process preserves 70-80% of nutritional properties and supports export growth. Modern technologies, organic certification, and sustainable practices enhance competitiveness. Future research should focus on energy efficiency and new markets.

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