Biological and nutritive value of milk and dairy products in the human diet

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Abstract: This paper examines the biological and nutritive value of milk and dairy products within the dietary patterns of the population of Uzbekistan. The role of traditional foods such as katyk, kurt, and suzma as key sources of protein, calcium, and vitamins is analyzed. Particular attention is given to modern consumption trends, regional differences, and the influence of socio-economic factors on the population's access to essential nutrients. The paper also presents original research findings demonstrating the contribution of dairy products to meeting the daily requirements for critically important micro- and macronutrients.

Keywords: dairy products, Uzbekistan, nutrition, nutritive value, protein, calcium, traditional products, consumption, health

Introduction:

For centuries, milk and dairy products have been an integral part of the traditional diet in Uzbekistan, forming the basis of many national dishes and serving as a key source of essential nutrients. In the context of modern challenges related to food security and public health, evaluating the biological and nutritive value of this product category has become especially relevant. This review aims to provide a comprehensive analysis of the role of dairy products in the nutrition of the population of Uzbekistan, considering them as a critically important source of complete protein, readily assimilable calcium, vitamins, and other essential nutrients necessary for maintaining the health of all age groups. Special attention is given to the current state of consumption, domestic production, and the potential for improving the population's nutritional status amid changing dietary habits and the country's evolving economic conditions.

Methodology for Comprehensive Assessment of the Nutritive Significance of Dairy Products in the Diet of the Population of Uzbekistan: This methodology is based on an integrated approach combining the analysis of actual consumption data and the evaluation of the nutritional value of products. The first stage involves collecting and systematizing representative data on the structure and volume of consumption of milk

and various dairy products (such as katyk, suzma, kurt, ayran) among different socio-demographic groups in Uzbekistan. Information sources include household budget surveys, national sales statistics, and specially designed food-frequency questionnaires adapted to the national dietary patterns.

The second stage includes laboratory analysis of the most commonly consumed dairy products in the region, assessing their content of key nutrients: complete protein, fat with detailed fatty acid composition, lactose, calcium, phosphorus, and vitamins A, D, B2, and B12. The obtained quantitative nutrient data are compared with consumption patterns, making it possible to calculate the actual contribution of dairy products to daily intake of critically important micro- and macronutrients. The final step involves determining the proportion of daily nutrient requirements covered by dairy products and identifying potential deficiencies in the population's diet.

Results: The study revealed significant differences in the level of dairy consumption between urban and rural residents, as well as its dependence on household income. On average, dairy products cover approximately 18-22% of the daily protein requirement and 45-50% of the calcium requirement in a typical household. However, this contribution is uneven: low-income groups experience a substantial deficiency in consumption - by 30-40% below the recommended norm - while higher-income groups consume dairy products at 85-95% of the recommended levels. Traditional fermented products such as katyk and kurt remain key nutrient sources in rural areas, whereas in urban settings the share of pasteurized milk and industrially produced yogurts is higher.

The analysis of the nutritional value of local products showed that traditional Uzbek dairy items exhibit high biological activity. In particular, kurt and suzma serve as concentrated sources of protein (up to 20-25%) and calcium, covering up to 15% of the daily requirement of this mineral with a portion of just 50 grams. At the same time, the study identified a concerning trend: despite their relatively high nutritional value, overall consumption of liquid dairy products (milk, katyk) has declined by approximately 15% over the past decade, especially among younger generations. This decline is partially compensated by an increase in the consumption of hard cheeses. These findings indicate shifting dietary habits and highlight the need for targeted programs aimed at promoting traditional and fortified dairy products to strengthen nutritional security.

Table 1.

List of Equipment Used for Laboratory Analysis of Dairy Products

Equipment	Manufacturer and Model	Purpose
Atomic Absorption Spectrometer	*Thermo Scientific iCE 3500*	Determination of macro- and microelement content (calcium, phosphorus, potassium)
High-Performance Liquid Chromatography (HPLC)	*Agilent 1260 Infinity*	Analysis of vitamin composition (vitamins A, D, B2, B12)

Ultrasonic Milk Analyzer	*Laktan 1-4*	Rapid analysis of basic composition (protein, fat, lactose, SNF)

Conclusion: Ultimately, dairy products - representing a living link to Uzbekistan's gastronomic heritage - possess undeniable potential for strengthening the nation's health. Reviving the culture of their consumption, grounded in contemporary scientific evidence, is not merely a matter of nutrition but a strategic investment in the country's future, where tradition forms the foundation for the well-being of new generations.

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