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Commentary

The Effect of Milk Products on Bone Development

Angelina Elote*

Department of Biochemistry, Harvard University, Massachusetts, USA

DESCRIPTION

With increasing per capita income and the popularization of healthy eating concepts, Chinese consumers are more interested in dairy products. Customers are paying greater attention to the quality and safety of dairy products as a result of the frequent occurrence of dairy product safety events, and some consumers choose imported dairy goods with high quality and low price. The development of China's dairy business is transitioning from quantity-based to quality-based, owing to agricultural supply-side reform. However, in the international dairy industry, there is still a long way to go to improve milk quality, and the disparity in resource endowments at home and abroad has resulted in a significantly higher price for domestic raw milk, even higher than the Cost, Insurance, and Freight (CIF) of imported dairy products converted into raw milk.

Body support, internal organ protection, mineral homeostasis, and acid-base balance are all functions of the skeleton. Bone strength is affected by bone mass, shape, microstructure, and material qualities. Maximal bone capital, or peak bone mass, is attained by the end of the second decade of life and permits us to successfully withstand mechanical overload under normal conditions. Genetic variables account for 60 to 80 percent of peak bone mass variation. Environmental variables can affect the impact of genetic determinants, degrade bone mass accumulation, alter bone turnover and/or bone strength, and hence increase fracture risk. Height increase and bone mineral mass accumulation follow a genetically set path during development and adolescence. Any dietary deficiency can change bone development and shift the trajectory to a less favorable one, resulting in a lower peak bone mass. Calcium, phosphorus, and protein are important dietary factors of bone mass accumulation. Dairy products include these nutrients.

In reality, one liter of cow milk includes 1200 mg/l of calcium, 1150 mg/l of phosphorus, 32-35 g/l of protein (casein and whey protein), as well as calories, trace elements, and vitamins. Whey proteins digest and absorb more quickly than casein proteins. Despite differences in milk composition according to cow breed, season, and food, commercially available milk is normally standardized and, in a few countries, fortified with vitamin D.

The nutritional content varies greatly depending on the species. Some plant beverages may have macronutrient quantities comparable to cow milk, such as protein content. Plant-based substitutes, on the other hand, require the addition of mineral salts and carbohydrates to achieve calcium and calorie concentrations comparable to cow milk.

However, the nutritional content of most plant beverages varies significantly. If cow milk is substituted with non-fortified and non-supplemented plant beverages, consumers risk numerous deficiencies, put children and adolescents at risk of serious metabolic abnormalities. The extra carbohydrate content, in fact, cannot be considered part of a healthy diet. The other products, with the exception of soy drink, cannot hold the term milk. Animal protein sources are more readily digested, and the distribution of key amino acids is thought to better meet human needs, notably for muscle and bone building.

Dairy products have been used by humans for millennia, as evidenced by processed dairy leftovers discovered in ceramic vessels unearthed in Dalmatia or Anatolia dating back to 6000 BC. Dairy protein found in dental calculus from northern Africa at least 6 millennia ago confirms consumption of cow, sheep, or goat milk. Fermented dairy products such as cheese and yoghurts have allowed milk to be preserved, transported, and digested more easily.

The effect of dairy products, which include a complex mix of macronutrients and micronutrients, in adult bone homeostasis remains unknown. Indeed, while milk and dairy products' natural purpose is to support normal growth of young mammals, the relevance of its nutritional content and dairy products as diets in young adults and the elderly to satisfy calcium and protein requirements is currently underappreciated.

Correspondence to: Angelina Elote, Department of Biochemistry, Harvard University, Massachusetts, USA; E-mail: angelina_e@harvard.edu
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