

# Dairy Vs Plant-Based Milk

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## Introduction

Are an increasing number of individuals opting for plant-based milk alternatives like oats, soy, or almonds? And do these plant-based products provide equivalent nutritional value compared to cow milk? Certainly, this does not apply universally. In low-income countries where diets heavily rely on cereals and staples with over 75% of calories coming from staples and protein intake is insufficient, switching from cow's milk to oat milk could be ill-advised. A glass of cow's milk might be the sole source of high-quality protein for the day. However, for many individuals plant-based milks serve as a suitable replacement, particularly benefiting those who are suffering from lactose intolerance. Indeed, it is not the sole reason for people to opt for plant derived milks over dairy milk. Authoritative bodies such as the (FDA) Food and Drug Administration, advise against consuming low-quality raw milk. Additionally, research indicates that higher consumption of saturated fats correlates with elevated cholesterol levels heightening the risk of stroke and heart diseases. Obesity indeed poses a significant risk for stroke, heart diseases and various cancers. However, if consuming a diet high in saturated fat is the only means for someone to maintain a healthy body weight it may be considered more advantageous in their particular circumstances. Nevertheless, numerous countries currently advocate for reducing saturated fat consumption, emphasizing monounsaturated fats found in foods like nuts, seeds, fish, and avocados [1]. Furthermore, the quality of raw milk directly influences the quality of dairy products.

Only raw milk of high quality produced under stringent hygiene standards can yield superior dairy products. Dairy production significantly contributes to the greenhouse gas emissions (GHG) and constitutes slightly over one quarter of the carbon footprint. Increasing awareness of this negative impact on the environment has led many individuals to explore plant-based alternatives. Surveys in the UK indicate that approximately one quarter of adults now incorporate some non-dairy milks into their diets. This trend is more pronounced among younger demographics (16- 23 years) opting for plant-based alternatives. Due to animal-based product production having a larger water footprint compared to plant-based products with equivalent nutritional value, when we analyze various environmental metrics for milk production such as use of land, GHGs, water utilization, and eutrophication intensity are estimated per liter of milk produced. Cow's milk production exhibits considerably higher environmental impacts when compared to production of plant-based alternatives across all standard metrics. It generates approximately three times more greenhouse gases, utilizes around ten times more land and consumes two to twenty times more fresh water. Additionally, it results in significantly higher levels of eutrophication.

A diverse array of plant-based milk alternative exists, sourced from various plants. The majority of plant-based milks can be classified into five main groups derived from legumes, cereals, pseudo-cereals, nuts and seeds. Products include soya, peanuts, rice, corn, quinoa, almonds, coconut, pistachios, flax seeds and sunflower seed milk. Milk alternatives like soy, almond and others are often compared to

cow's milk due to the recognized distinction in composition between animal and plant derived foods. Plant derived proteins do not match the nutritional quality of those from animal sources. In addition to protein content significant differences exist in the natural nutrients found in cow's milk compared to plant-based alternatives, such as vitamin B12, calcium, fiber, and fat content and concentration (Vanga and Raghavan, 2018). Presently according to American Dietary Guidelines fortified soy beverages are categorized in milk group due to their essential nutrients profile resembling that of cow's milk. Similarly fortified soy milk is considered as a healthy dietary pattern because it provides numerous minerals (calcium, potassium, phosphorus, magnesium, zinc, selenium) and vitamins (A, D B12). When shopping for plant-based foods it's crucial for consumers to check the Nutrition Facts label and opt for products high in proteins, calcium, potassium and vitamins while being low in saturated fatty acids and sugar contents. Regulations regarding the labelling of plant-based milks or beverages vary from one country to another. Currently many countries such as India and China, freely use the term dairy for plant-based beverages.

However, in the United States and the UAE the term Soya preceding milk label shows that beverage is not cow milk and is subjected to documented specific non-dairy standards. (FDA, 2018). Countries like Australia and New Zealand include soya milk among legally marketed brands [2]. However, European countries do not use the term milk for plant-based alternatives and label them as drink (Soya Drink).

Cow milk offers a unique combination of nutrients, including high quality proteins, minerals and vitamins which are essential for bone and muscle development and overall well-being. Additionally, cow's milk naturally contains important fatty acids like omega-3s. Its rich taste and cream-like texture makes a versatile ingredient in different culinary creations from creamy sauces to decadent desserts. Moreover, cow's milk has been a dietary staple for centuries providing a culturally and historically significant source of nourishment for many communities around the world [3]. The dairy industry has shown resilience and adaptability in responding to the rise of plant-based milk alternatives. Through innovation by introducing new products including lactose-free milk, fortified milk, and flavored varieties, to meet evolving consumer preferences. Additionally, partnerships with plant-based companies and investments in sustainable practices demonstrate the industry's commitment to remaining competitive while addressing environmental concerns. This proactive approach not only ensures the longevity of traditional dairy products but also fosters greater choice and accessibility for consumers seeking dairy and plant-based options alike.

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