

“MYLK”: An Overview

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Abstract – The term "mylk" is used for plant-based white liquids such as soya, coconut, cashew, almond, rice, pea, and hazelnut milks- an alternative to animal milk. In some studies, researchers have indicated that high dairy consumption is a source of diseases such as lactose intolerance, high cholesterol, acne, etc. This article presents plant-based alternatives to milk and dairy products and their health benefits.

Index Terms – Vegan, Plant milk, Animal milk, Milk and its products, Health benefits, lactose intolerance, allergic reaction

I. INTRODUCTION

It is a term for the white liquid obtained from plant sources such as almond, cashew, soy, coconut, etc. The dairy industry is considered to be cruel to animals and harmful to the environment. For this reason, many people choose to give up animal products and go vegan. In addition, dairy is now considered a cause of many diseases such as lactose intolerance, high cholesterol, etc. With the increasing popularity of vegan and vegetarian diets in the U.S. and Europe, "mylk" or milk alternatives have become a billion dollar industry there. Plant-based milk substitutes are used in many foods such as plant-based yogurt, cheese, kefir, butter, ice cream, etc. They are also suitable for consumers with lactose intolerance, acne and cow's milk allergy. They are rich in antioxidants, unsaturated fatty acids and bioactive compounds that reduce the risk of certain cancers, atherosclerosis and diabetes.



Fig 1- Types of plant based milk

II. LITERATURE SURVEY

Janssen et al. (2016) and Sebastiani et al. (2019) reported that consumers nowadays are switching to plant-based foods such as fruits, vegetables, nuts, grains, etc. because they are dissatisfied with animal brutality, want a healthy lifestyle, and are environmentally conscious. Pistollato et al (2018) found that a plant-based diet reduces the risk of neurodegenerative diseases and cardiovascular diseases.

As indicated by a market study, the consumption of plant-based white liquid is becoming increasingly popular. It is developing the quality of vegan milk and also the understanding of vegan products and their health benefits. Nevertheless, the industry has identified some sensory problems due to the large insoluble particles. (Kwok and Niranjana, 1995, Durand et al., 2003).

Vegan milk has many functional properties that benefit health. Due to the popularity of the vegan lifestyle, people and the food industry are moving towards plant-based alternatives (**Vanga and Raghavan, 2018: 10-20**).

According to **Pritulska et al. (2021)**, in Ukraine, it was found that taste was the most important element in the choice of product and almond milk (20.4%) was the most preferred plant-based milk, followed by oats (15.3%), soy (12.3%), rice and buckwheat (10.1% each), and 16.2% preferred no plant-based milk analogues. Consumption of plant-based dairy products was highest among 25-30 year olds, followed by 18-24 year olds and 50+ year olds. In India, it was observed that consumption of soy and almond milk was highest in the past 12 months (56% and 54%, respectively), followed by plant-based cheese (31%), oat milk (29%), and plant-based yoghurt (21%). (**Narsaria and Rajyalakshmi, 2020**).

Plant-based milk contains too little lactose and cholesterol and has a lower quality of protein. Because of the poor quality of the protein, they are enriched with proteins and enzymes and 2 or more types of vegan milk are combined to obtain a highly nutritious product that must also be supplemented through the diet (**Silva et al., 2020: 131**).

➤ Types of Vegan milk (Mylk)

• Rice Milk

According to **Karimdstjerd and Konsukan, (2021)** **Vanga and Raghavan, (2018)** rice (*Oryza sativa*) is rich in carbohydrates that break down into sugars and give the product a sweet taste. It has a lower content of proteins, lipids, vitamins and minerals, so it needs to be fortified with vitamins and minerals. They contain a lot of selenium and magnesium, which helps to strengthen immunity. Since it is not allergic and does not contain lactose, it is suitable for people with lactose intolerance. Brown rice milk contains more nutrients, low starch, high in complex CHO, low glycemic index compared to white rice and therefore helps prevent diabetes mellitus type 2.

Compared to all plant-based dairy products, rice milk contains less protein and soy milk contains the highest protein content (**Aydar, 2020**). The nutritional composition of rice milk in 240 ml is 130 kcal, 1.01 g protein, 1.99 g total fat without saturated fat, 27 g carbohydrate, 300 mg calcium, 1.08 mg iron, 101 IU vitamin D (Bridges, 2018). It also contains a functional component - phytosterols such as bitosterol and C-oryzanol, which have many health benefits such as lowering cholesterol, anti-hypertensive, anti-diabetic, anti-inflammatory, and antioxidant properties (**Sethi et al., 2016: 3408-3423**).

• Soya Milk

Soy milk is often used as a substitute for cow's milk because it has similar nutritional value and numerous health-promoting properties (**Nowshin et al., 2018:158-163**). It is a good source of macro- and micronutrients. It contains essential amino acids and is low in CHO. It also contains essential fatty acids: monounsaturated and polyunsaturated fatty acids (PUFAs and PUFAs), vitamins and minerals and no cholesterol; it is rich in phytochemicals (such as phytosterols, isoflavones, genistein, saponins, phytic acid, etc.) and has lipid-lowering and antioxidant properties. All these properties make it suitable to have therapeutic benefits and protect against various diseases, such as: Cardiovascular diseases, diabetes, BP, cancer, kidney problems, and osteoporosis (**Anisur et al., 2016: 192-203; Eslami and Shidfar, 2019: 82-88; Nowshin et al., 2018:158-163**).

• Coconut Milk

Alyaqoubi et al. (2015) noted that coconut milk is used as a milk substitute in both household and industrial applications. Coconut milk is rich in fats and calories and also contains medium chain triglycerides (easily digestible), lauric acid, which has antimicrobial, antibacterial, and antiviral properties and strengthens the immune system. Due to lauric acid also reduces the risk of cardiovascular disease.

It also contains some phenolic components and has antioxidant properties (contains vitamin E), which play a positive role in oxidative stress and damage, have anti-cancer properties, prevent degenerative diseases, delay the aging process, nourish the skin and have a calming effect (**Karunasiri et al., 2020; Tulashie et al., 2022**). In a study, **Ekanayaka et al (2013)** found that coconut milk increases HDL levels and protects against cardiovascular disease.

• Almond Milk

Almond milk is popular for its therapeutic qualities, as it has a good quality of lipids and antioxidants and has immune-boosting properties (**Kundu et al., 2018**). According to **Torna et al (2014)**, almond milk has 50% low calories and is used for weight loss (**Katz, 2018**).

Zaidan and Tamimi (2016) found that almond milk helps to reduce weight, BMI, and waist and hip circumference. According to **Alozie (2015)**, it improves blood, oxygen and nutrient flow and controls BP.

It consists of a balanced diet with CHO, protein, fats with a higher proportion of monounsaturated fatty acids and without cholesterol, fiber, vitamins and minerals such as calcium, magnesium, phosphorus, potassium, sodium, selenium, zinc, vitamins C, B1, B2, B3, B6, B9, and vitamin E (**Torna et al., 2014: 215-222; Savchuk et al., 2015; Zaidan and Tamimi 2016: 466-471**).

Savchuk et al (2015) also noted that it promotes vision, development of strong bones, and maintains kidney functions. It is not suitable for nut allergy sufferers (**Katz, 2018: 4-12**).

III. CONCLUSIONS

Vegetable dairy products are the best alternative to dairy products. They have many beneficial properties that are helpful for maintaining body functions. They contain antimicrobial and antibacterial properties that strengthen the immune system. They also contain antioxidants, immune-boosting properties, low cholesterol, vitamins and minerals. They promote healthy bone development, increase HDL levels, maintain kidney function and reduce the risk of cardiovascular disease. Vegan milk has some therapeutic values and protects against various diseases.

However, they also have some negative effects. Plant milk is usually low in calcium and iodine and has anti-nutritional properties, so it cannot meet nutritional needs compared to cow's milk. To overcome this, we need to fortify plant milk.

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