

Understanding Dairy Analogues

Ravi and Vipul Jaglan

College of Dairy Science & Technology, LUVAS, Hisar, Haryana

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Introduction

Products obtained by processing milk of any milch animal are termed dairy products. However dairy analogues (soy milk, tofu, cheese analogues etc.) are alternate of dairy products. Dairy analogues are cost effective and offer good nutritional value (1). Nowadays, people are demanding plant based milk instead of animal milk due to many illness reasons like lactose intolerance, high level of cholesterol in animal milk and hypersensitivity towards milk protein. Plant based analogues of milk are produced from legumes, cereals, seeds etc.

There are many orthodox varieties of milk analogues are present in market like sikhye (cooked rice), Boza (fermented drink from wheat, rye, maize etc.), soy milk. Soy milk is very popular plant based milk analogues (2). Plant based milk analogues like almond, walnut, soy, coconut milk are formed by using following steps- milling, filtration, incorporation of ingredients, heat treatment, homogenization, packaging and storage at desirable temperature. In plant based milk analogues we can also add proteins, vitamins and minerals to enhance the nutritional value of product. Fortification of plant based milk is also a great concern because nowadays people are worried about what they eat (3).

Plant based milks

Soy milk

Soy milk first came into market in 1940 in China (Hong Kong) (2). Food and agriculture organization (FAO), confirmed that soy bean plant is oilseed instead of pulse. Its scientific name is *Glycine max*. Soy milk is produced from soybeans. Soybean is almost identical to animal milk, have pale yellow color same as animal milk. Main difference between soy milk and animal milk is that soy milk is cholesterol and lactose free, it's also contains few fiber content (4).

Almond milk

Conventionally, almond drinks were taken due to organoleptic properties of almond. Currently, almond milk is most preferred beverage among all almond beverages especially in

North America, Australia, Europe. Almond milk came into market for the children having hypersensitivity towards cow's milk and people having lactose intolerance. Almond is rich source of monosaturated fatty acids(MUFA) ,it assist in weight reduction (6). Ash content and crude fiber is high in almond milk. It also contains essential minerals like calcium (13.1mg/100ml), potassium (65.33mg/100ml), phosphorus (75.2mg/100ml), magnesium (42.05mg/100ml). Almond milk have more desirable color, flavour and taste than soy milk. Also have low calorie content than soy and cow milk (7). Human body is not able to make Vitamin E, so people also consume almond milk because it is good source of Vitamin E (act as antioxidant) in the form of alpha-tocopherol and manganese (8). For preparation of Almond milk we take almonds and clean water, vitamins, minerals and salt. We also add ingredients like gums, ascorbic acid, lecithin. First we boil mix of Almond powder and water on 90°C. Then centrifugation is done to remove undesirable particles. Homogenization of almond is done for desirable body and appearance. We can also done pasteurization to lower the microbial load and to increase shelf life of milk (9).

Coconut milk

Coconut milk is watery portion that is squeezed out from coconut milk. Coconut milk is also present in powder form. At small scale for preparation of coconut milk we add water into grated coconut meat and stir it properly in mixer then filter the coconut milk with the help of sieve (10). For large scale production of coconut milk in industries screw drive and hydraulic machines are used for the pressing. Coconut milk is oil-in- water type suspension. Quality and composition of coconut milk is influenced by the coconut meat we use. Proportion of water with coconut meat varies between 1:1 to 1:20. During preparation of coconut milk fat content is maximum when coconut milk drawing out temperature is 55°C (11).

Approximately 25% coconut fruit is used to prepare coconut milk. According to studies coconut have moisture content 54%, fat 35% and 11% SNF. In comparison to cow's milk coconut milk is good source of fat and calories. Phospholipids, lecithin and cephalin are present in coconut milk act as emulsifying agents for the firmness of milk. There is also phenolic compounds present in coconut milk responsible for antioxidant properties.(12).

Oats milk

Oat milk is popular among people because it is curative in nature. It contains high fiber (beta – glucan) content in comparison to other milk analogues. People preferred oat milk due to ability of beta – glucan to lower down cholesterol level and also minimum glucose level in blood. Starch (55-60%) is the main component of oats (8).

During preparation of Oats milk first we submerged oats in water in ratio of 1:2.7 for approximately 1 hour, time of soaking vary according to method of preparation of oat milk. After this, oats are crushed in milling machine. Then oats mixture is fermented with enzyme (alpha- amylase ,77.78mg /kg) for dissolving of oats completely. Incubation of mix is done at

75°C for 49 minutes. Filtration of oats milk is done to remove undesirable substances. At last to stop the activity of enzyme in milk we give thermal treatment of 100°C for 5 min(13).

Tofu

Tofu is a product of soybeans, it is also known as soybeans curd. Traditionally it was produced in china 2000 years ago. Formation of tofu is based on intrinsic (condition of soybean) and extrinsic factors (processing circumstances) (14). Tofu is a Japanese word used for the curd of beans. Tofu is a wealthy source of essential amino acids, low calorie, low saturated fat and also have antioxidants. Tofu is widely consumed in Nigeria because of its high nutritional value (15).

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