

Plant-Based Milks: Oat¹

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Oat milk is one of the more recent dairy alternatives to hit the grocery shelves, and several brands are currently available in the United States. Oat milk is made from the cereal grain oats. This publication describes how oat milk is made, its ingredients and nutrient profile, and the potential health benefits and risks of consumption.



Figure 1.
Credits: Lincoln Zotarelli, UF/IFAS

How is oat milk made?

The main ingredients in oat milk are water and oat flour. The variations between brands come from the additional ingredients, which may include vegetable oil, salt, stabilizers, vitamin and mineral blends, sweeteners, and flavors. Some brands have original, full-fat or extra creamy, and low-fat options, and they may be available in vanilla and chocolate flavors.

The typical process of making oat milk is quite simple. First, the rolled oats are combined with water to create a slurry. This mixture goes through a hydrolysis process, which breaks down the starch to prevent gelatinization and thickening at high temperatures (Sethi, Tyagi, and Anurag 2016). The final step is filtration. The final product is typically shelf-stable following ultra-high temperature (UHT) processing and can be stored at room temperature until the best-before date. However, UHT oat milk requires refrigeration after opening.

How does the nutrient profile of oat milk compare to cow's milk?

Most unsweetened oat milks, with no added oil, provide about 90 calories per 1 cup (8 oz) serving (USDA n.d.)—fewer calories than whole and low-fat cow's milk, and a little more than skim (fat-free) milk. The full nutrient breakdown of a serving of unsweetened oat milk, compared to whole, low-fat, and fat-free cow's milk, is shown in Table 1. However, keep in mind that the nutrient profile of oat milk varies from brand to brand.

Oat milk contains less saturated and total fat than whole and low-fat cow's milk (USDA n.d.; Planet Oat Oatmilk n.d.). Skim cow's milk is fat-free, compared to oat milk, which usually has added oil. Regarding protein content, a serving of oat milk has much less protein than cow's milk. Oat milk is higher in carbohydrates than cow's milk; it contains starch and 4 g of sugars (USDA 2020; Planet Oat Oatmilk n.d.). Oat milk also provides 2 g of fiber per

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serving compared to none in cow's milk. Many of the commercially available oat milks are fortified with calcium, riboflavin, and vitamins A, D, and B12. The sodium content of oat milk, a nutrient that is overconsumed in the United States, is similar to cow's milk (USDA n.d.; USDA and USDHHS 2020).

What are the potential health benefits of oat milk?

Oats are a source of beta-glucan, a type of fiber that has been shown to decrease LDL (bad) cholesterol (Ho et al. 2016). Consuming oats, compared to foods without beta-glucan, reduces blood cholesterol, as well as after-meal blood glucose and insulin, a hormone that regulates the amount of glucose in the blood, in people with type 2 diabetes (Hou et al. 2015). However, it may be difficult to consume enough beta-glucan fiber to achieve these effects, given that fiber levels may vary from brand to brand due to different processing methods (Chalupa-Krebsdack, Long, and Bohrer 2018). It is important to note that the health benefits of oat milk have not been studied.

Oat milk does not contain any of the top eight allergens—dairy, eggs, fish, crustacean shellfish, tree nuts, peanuts, wheat, and soybeans (FDA 2023)—and thus is an appropriate choice for adults with any of these allergies. Also, oats do not contain gluten, a protein that must be avoided by those with celiac disease or gluten intolerance. However, oat milk may be processed in facilities that also process wheat and dairy, where there is a possibility of gluten cross-contamination. If you are concerned about gluten, look for a product with a “gluten-free” label on the packaging, which may be used voluntarily to label foods with less than 20 parts per million (20 ppm) of gluten (FDA 2020). Oat milk is also lactose-free, making it suitable for individuals experiencing lactose intolerance.

Oat milk is vegan/vegetarian friendly. However, it should be emphasized that the nutrient profile is quite different from that of cow's milk, most importantly, providing much less protein. To ensure an adequate protein intake, particularly in a vegan diet, other plant sources of protein need to be emphasized.

What are the possible risks of consuming oat milk?

Oat milk allergy is possible, but oats are not a common food allergen in the United States (FDA 2023). One potential disadvantage of consuming oat milk is that it contains

more total carbohydrate per serving compared to cow's milk. This may be a concern for individuals with diabetes who limit carbohydrate intake to help manage their blood glucose levels.

Is oat milk an appropriate choice for children?

Children require calcium, vitamin D, and protein for optimum growth and development. Oat milk, due to fortification (added nutrients), contains slightly higher amounts of calcium and vitamin D than cow's milk. However, oat milk contains only about 25% of the amount of protein provided by cow's milk or soy milk (USDA n.d.; Planet Oat Oatmilk n.d.). This is a concern given the important role of protein in child growth. Oat milk may be suitable for a child with a soy or dairy allergy, but protein intake may need to be increased through other foods. Flavored and sweetened oat milks are sources of added sugars and reducing added sugar intake is recommended in the Dietary Guidelines for Americans (USDA and USDHHS 2020). Because oat milk is typically more expensive than cow's milk, families without allergies or other food restrictions may find cow's milk an affordable source of protein and other nutrients.

Oat milk is not appropriate for infant feeding. Breastmilk is the gold-standard, recommended source of nutrition for infants (WHO n.d.). If breastfeeding is not possible, an appropriate infant formula must be provided. Consult your health professional if you have questions about infant and child feeding and nutrition.

Summary

Oat milk is one of the only plant-based beverages that provides fiber and its related health benefits. Although oat milk may be an appropriate choice for adults, especially for those with allergies to milk and soy or those choosing to follow a vegan diet, given its low protein content, it may not be the optimal choice for child growth.

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Table 1. Nutrient profile of oat milk compared to fat-free, low-fat, and whole cow's milk.

	Unsweetened oat milk (1 cup)	Skim (fat-free) milk (1 cup)	Low-fat (1%) milk (1 cup)	Whole milk (1 cup)
Energy (Kcal)	91	83	102	150
Protein (g)	2	8	8	8
Total fat (g)	1.5	0	2.4	8
Saturated fat (g)	0	0.1	1.5	4.5
Carbohydrate (g)	19	12	12	12
Fiber (g)	2	0	0	0
Total sugars (g)*	4	12	12	12
Vitamin A (mcg)	180	149	142	112
Vitamin B12 (mcg)	0.2	1	1	1
Vitamin D (mcg)	4	3	3	3
Calcium (mcg)	350	298	305	276
Sodium (mg)	120	102	107	105
Potassium (mg)	401	381	366	322
Source: USDA n.d.; Planet Oat Oatmilk n.d.				
* No added sugars				