Looking for an alternative to cow’s milk? Here’s what you need to know.

By Frankie Wood-Black

Go to the dairy section of any grocery store, and you’ll find a variety of milks made from soy, nuts, or rice in addition to good ol’ cow’s milk. Plant-based beverages aren’t necessarily new (almond milk has been around for centuries), but their production has boomed in recent years. If you’re looking to replace cow’s milk, how do you know what to choose?

To understand the difference between plant milk and animal milk, let’s first turn to biology. Animal milk is a complex fluid produced by the mammary glands of female mammals to feed their young. In some ways, the nutritional purpose of animal milk resembles that of nuts and seeds (technically, what we usually call nuts, such as almonds and walnuts, are seeds). Seeds contain nutrients that embryonic plants use to develop into seedlings.

Of course, a new plant’s nutritional needs are distinct from what a nursing animal requires. And the process of getting milk from seeds is completely different from milking an animal. “Milking” seeds involves soaking them, blending them with water, and straining them.

Given the differences in how milks are produced, let’s see how the nutritional profiles compare.

What’s in dairy milk
You probably already know that cow’s milk is a good source of calcium. But it’s also a source of many vitamins, minerals, and lipids—or fats. Additionally, it contains sugars, hormones and proteins, such as casein, immunoglobins, cytokines, and enzymes. (The latter three types of proteins help nursing animals grow and develop their immune systems, but wouldn’t necessarily have the same effect on you.)

This mixture is also complex from a physical standpoint. Milk is primarily water with sugars, minerals,
Have you heard the expression: Cream rises to the top—as in the brightest people or ideas will naturally succeed? You can probably guess why we’re bringing it up here: The saying comes from the chemistry of milk.

Milk is an emulsion, a suspension of droplets of one liquid in another liquid, not a solution in which a solute dissolves in a solvent to create a uniform mixture. If you let raw cow’s milk sit for a bit, the fats in the milk will rise to the top because they are less dense than water, a major component of milk. The fat layer can be easily separated from the rest of the milk.

But you don’t see separation in store-bought milk. The milk has been homogenized, which involves a mechanical process that breaks up the fats into smaller sizes to allow them to stay suspended in the watery mixture.

Botanical beverages abound

Today, many people are choosing not to drink cow’s milk for several reasons. Some people are allergic to milk proteins. Others are lactose intolerant. Cultural, personal, and environmental considerations provide additional reasons for some people to avoid cow’s milk.

The most widely available plant-based milk alternatives in the United States are derived from soy, rice, almond, and coconut. Also available are milk beverages made from peas, oats, cashews, potatoes, flax, hemp, sesame, and peanuts. Like store-bought cow’s milk, plant-based milks are a suspension of ingredients. But from a nutritional standpoint, how do plant-based alternatives compare to cow’s milk?

The short answer is: It depends. The nutritional value varies from product to product, and it might or might not provide the equivalent nutritional value of traditional cow’s milk. To make sense of the varieties, first consider what your body needs.
The current U.S. dietary guidelines recommend that we consume dairy products, including milk, yogurt, and cheese, which are excellent sources of calcium, potassium, phosphorus, vitamin D, and protein.

Calcium, potassium, phosphorus, and vitamin D are essential for bone health. Calcium is also important for the development of strong teeth. And diets rich in potassium can help maintain healthy blood pressure, while proteins contribute to building muscle.

Additionally, proteins provide amino acids that our bodies need. So, when nutritionists look at protein quality, they are looking at the amino-acid composition, digestibility, and bioavailability—that is, how much of the protein your body can use.

Cow’s milk typically has better protein quality than that of plant-based milks because the proteins are made with a wider array of amino acids and are easier for our bodies to use.

The one plant-based exception is soy. Soy contains the nine essential amino acids that the human body can’t synthesize—so like cow’s milk, soy is considered a “complete” protein source. As for nutrients, such as calcium, potassium, and vitamin D, they can be added to make soy-milk nutrition closer to cow’s milk. Because of this and its complete protein content, fortified soy milk is the one plant-based milk the U.S. dietary guidelines list under the dairy recommendations.

But as with milk proteins, nut or soy proteins can cause allergic reactions in some people, so products with these ingredients aren’t right for everyone. Additionally, if you’re looking for a source of phosphorus, zinc, thiamin, vitamin B6, vitamin E, vitamin K, and folate, cow’s milk has these nutrients, but they are not always found in plant-based alternatives. So, while nut and seed milks provide some benefits, they do not have the same nutritional value as cow’s milk (see chart).

The bottom line
Curious to learn more about the potential health effects of increasingly popular milk alternatives, researchers have done some investigating and found that plant-based beverages could have benefits beyond providing proteins, vitamins, and minerals.

For example, soy milk contains isoflavones that some research suggests can protect against cardiovascular disease and osteoporosis. Peanut milk and almond milk contain antioxidants in addition to vitamin E that can guard against cellular damage. Coconut milk contains lauric acid, which some research suggests promotes brain development and helps boost the immune system.

The bottom line: Botanical milks differ considerably from cow’s milk. And knowing the differences can help you make more informed decisions about your drink—or drinks—of choice.

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Selected References
