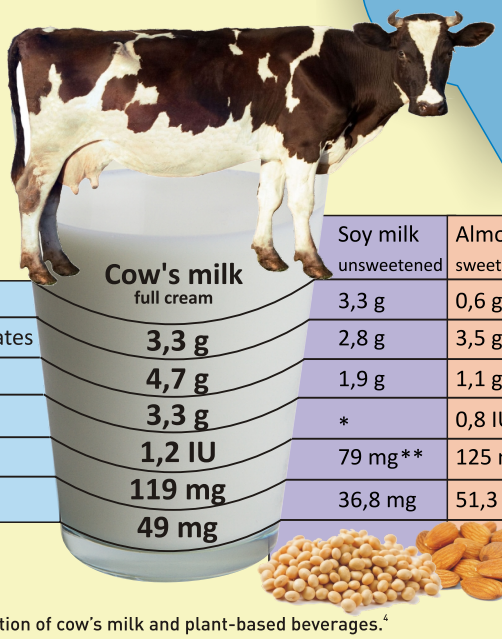
ARE PLANT-BASED BEVERAGES AS GOOD AS COW'S MILK?

Milk and other dairy products are nutrient dense and provide high-quality protein and a variety of important micronutrients in an easily absorbed form. Health authorities recommend the daily intake of dairy products to achieve optimal growth and maintain good health.[1]

Owing to dietary or lifestyle preferences, some consumers opt for plant-based beverages such as coconut, almond, soy, rice and oat milk as an alternative to cow's milk.

Although these products look like milk or are labelled 'milk', these plant-based beverages differ considerably from cow's milk with regard to nutritional composition. As a result, more specific labelling practices for plant-based milk alternatives have recently been called for.[3-5]



How does the nutritional composition of cow's milk and plant-based beverages compare?

Plant-based beverages generally do not have the same nutritional composition as cow's milk, specifically with regard to protein and micro-nutrients such as calcium and vitamin D. Commercially available plant-based beverages are therefore often fortified.

A comparison of the nutritional composition of cow's milk and plant-based beverages is given in Table 1. To get a representative quantity, values for plant-based beverages are given as an average across four products consumed in the South African market.

	Soy milk unsweetened	Almond milk sweetened	Rice milk unsweetened	Coconut milk unsweetened
Protein	3,3 g	0,6 g	0,2 g	0,2 g
Carbohydrates	2,8 g	3,5 g	11,4 g	2,2 g
Total Fat	1,9 g	1,1 g	1 g	11, 5g
Vitamin D	*	0,8 IU	*	*
Calcium	79 mg**	125 mg**	110,7 mg**	*
Sodium	36,8 mg	51,3 mg	29,5 mg	30,2 mg

*Nutritional analysis not performed
** Fortified with calcium

Table 1.
Comparison of the nutritional composition of cow's milk and plant-based beverages.[4]

Protein in cow's milk and plant-based "milk".

Cow's milk and plant-based beverages differ considerably with regard to the relative amount and quality of their protein content. Cow's milk typically contains approximately 3.3% protein, whereas plant-based milk beverages generally contain around 0.5% protein (this excludes soy milk, which has a protein content of approximately 3.3%).[7-9] This difference is due to the presence of various biologically important mediators in cow's milk, whereas the same components are not present in plant-based beverages.

Cow's milk is also naturally high in 'complete' protein, whereas plant-based beverages contain mostly 'incomplete' protein. Owing to the ratio of essential amino acids in animal-derived protein, the protein in cow's milk has a higher bioavailability than that of plant-based beverages. For example, the nutritive value of soy protein is limited by its lower content of methionine and cysteine.[10]

Calcium in cow's milk and plant-based"milk".

Adding calcium to a product does not guarantee nutritional equivalence to other products that naturally contain similar amounts of calcium. Owing to the difference in the bioavailability of nutrients in fortified products, fortified non-dairy beverages cannot be considered nutritionally equivalent to cow's milk.

One of the factors influencing the absorbability of the fortified substances is the physical state of the substance in the fortified beverage and its interaction with the food matrix. Calcium in cow's milk is highly bioavailable and provides more than half of the recommended dietary allowance (RDA) in the typical diet of toddlers and young children. The presence of milk constituents such as lactose and casein phosphopeptides also increases the intestinal permeability for calcium salts, which increases intestinal absorption.[11] The lack of these substances in plant-based beverages may explain, in part, the difference in bioavailability of calcium.

What are the consequences of replacing cow's milk with plant-based "milk"?

There are arguments both for and against the use plant-based beverages as a replacement for cow's milk in the case of low-dairy diets.[12-17] However, concerns related to the lack of bioactive nutrients, the risk of excess energy intake and the relative bioavailability of calcium have been raised. A number of studies have shown that excluding dairy in favour of plant-based beverages may lead to nutritional deficiencies and possible detrimental effects with regard to growth and development in children and adolescents.[9,13,18-20]

CONCLUSION

Current evidence indicates that the sum of the nutrients in the dairy food structure (referred to as the dairy matrix) has specific health effects compared with that of single nutrients.[21] As plant-based beverages differ considerably from cow's milk with regard to nutritional composition and bioavailability of nutrients, replacing cow's milk with plant-based milk alternatives may result in unintended nutritional consequences. It is therefore important that plant-based beverages should not be considered a nutritional substitute for cow's milk.

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