Are you milking your beverages for all they're worth?

Why do people exclude milk from their diets?

- Cow's milk allergy
- Lactose intolerance
- Following a trend
- Exclusion diets
- Personal lifestyle, e.g. vegan
- Beliefs about animal mistreatment

Milk alternatives

- National Osteoporosis Society: 70% of individuals between 18 - 24 have tried diets cutting out major food groups
- Survey from the United States Department of Agriculture (USDA): progressive decrease in consumption of cow's milk with concurrent increase of non-dairy beverages

Are plant-based beverages as good as cow's milk?

- Plant-based beverages as alternatives to cow's milk
- Several are fortified
- Assumption that dairy alternatives are just as healthy as dairy foods

Milk alternatives

- If something is called “milk”, it has the same nutritional properties as cow's milk
- Nutritional contents of plant-based products depend on the source, methods of processing and fortification

Typical plant-based alternatives

- Soya milk
- Almond milk
- Coconut milk
- Rice milk
- Oat milk

Are milk substitutes suitable as a milk replacement?

- Plant-based milk alternatives do not have the same nutritional content as cow's milk
- Main difference: alternatives are not innately high in nutrients necessitating fortification
- Cow's milk is a natural source of calcium and other micronutrients, with a higher bioavailability

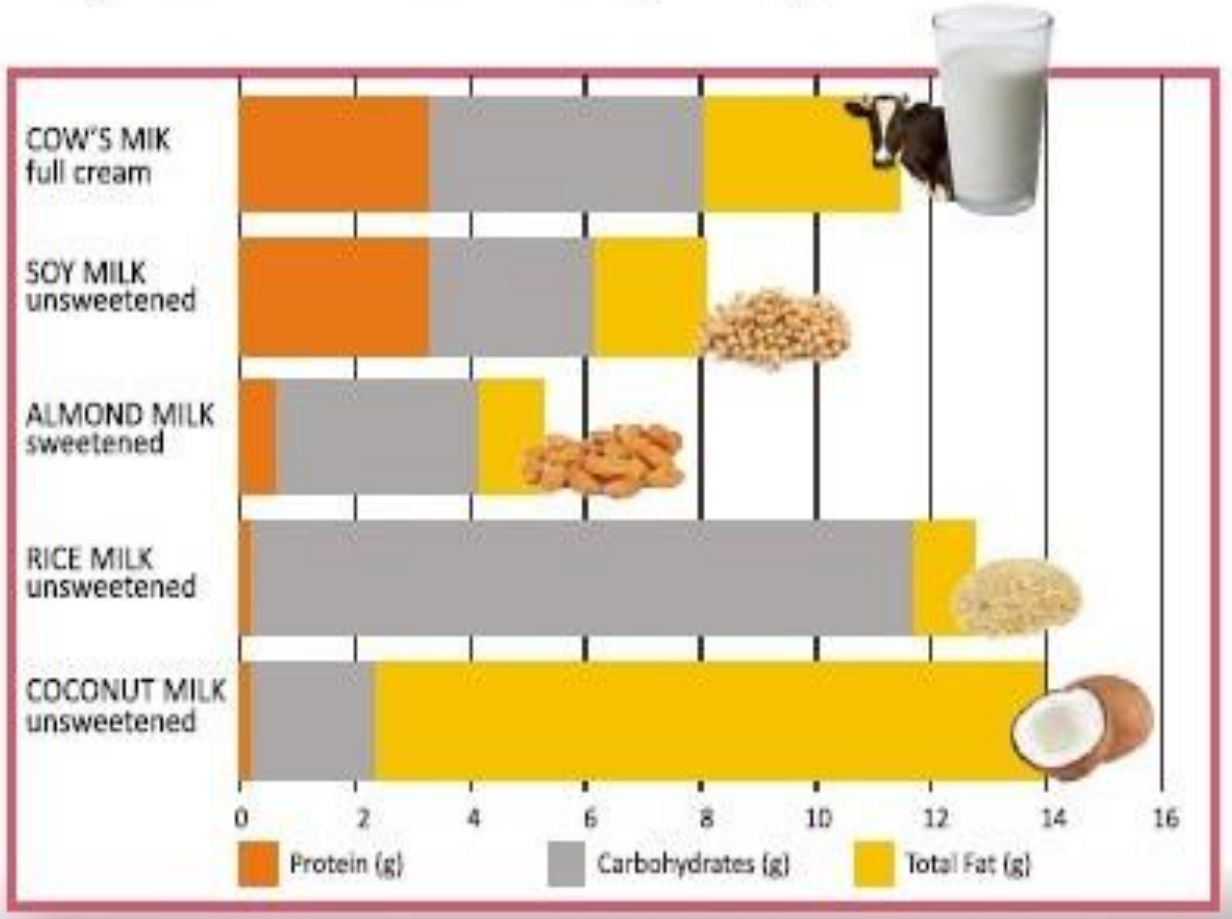
	Cow's milk full cream	Soy milk unsweetened	Almond milk sweetened	Rice milk unsweetened	Coconut milk unsweetened
Protein	3,3 g	3,3 g	0,6 g	0,2 g	0,2 g
Carbohydrates	4,7 g	2,8 g	3,5 g	11,4 g	2,2 g
Total Fat	3,3 g	1,9 g	1,1 g	1 g	11, 5g
Vitamin D	1,2 IU	*	0,8 IU	*	*
Calcium	119 mg	79 mg**	125 mg**	110,7 mg**	*
Sodium	49 mg	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]

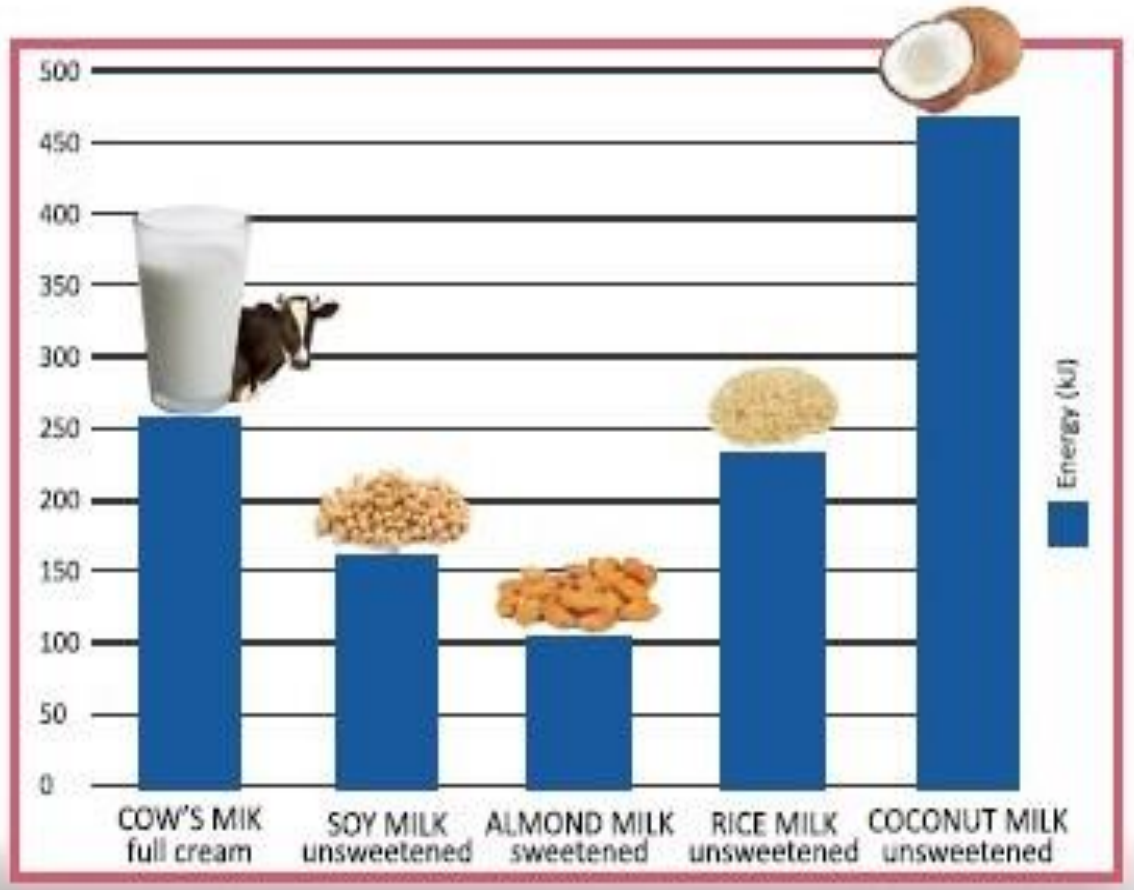
Graph 1.

Comparison of macronutrients per 100 g.



Graph 2:

Comparison of energy content (kJ) per 100 ml.

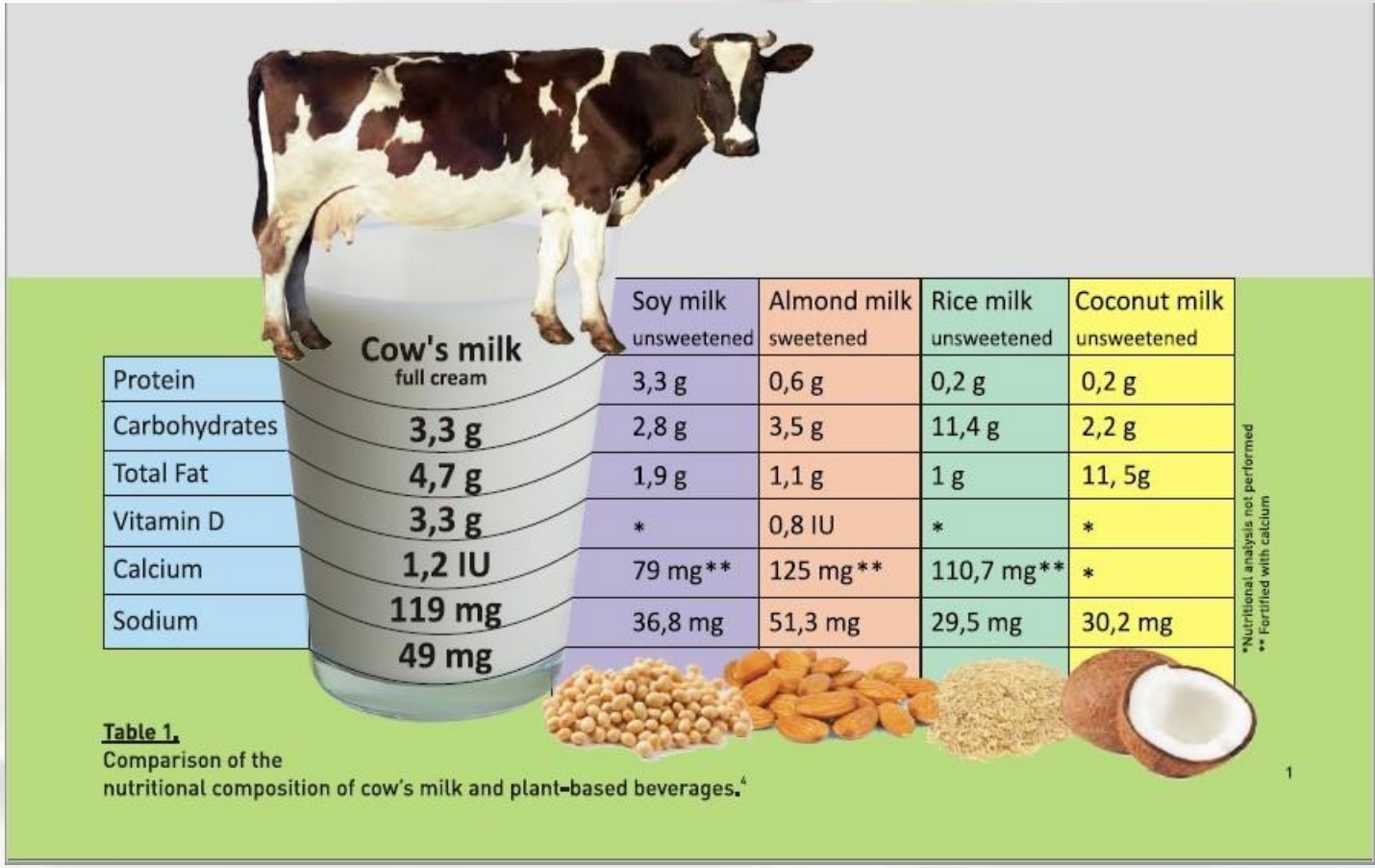


Is calcium fortification nutritionally equivalent?

- Fortification of non-dairy beverages with micronutrients cannot be considered nutritionally equivalent
- Absorbability of the fortified substances influenced by physical state and interaction with food matrix
- Concern is fortified calcium

Is calcium fortification nutritionally equivalent?

- Calcium in cow's milk highly bioavailable
- Provides more than half of the RDA in toddlers and young children



	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

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

What is the consequences of using substitutes?

A few concerns present themselves

- Lack of bioactive nutrients found in milk
- Risk of excess energy intake
- Bioavailability of fortified calcium
- Individuals do not necessarily compensate for the low calcium intake

What is the consequences of using substitutes?

- Dairy forms part of daily intake to meet calcium recommendations for skeletal development and maintenance of bone health
- Dairy intake is essential for the accretion of peak bone mass during growth (protect against osteoporosis) and to serve a cardio-protective role

What is the consequences of using substitutes?

- Milk alternatives do not contain adequate levels of Vitamin D
- Study on ~3,000 pre-schoolers showed low vitamin D levels in 5% of children who drank only cow's milk, compared to 11% of children who drank only milk substitutes

What is the consequences of using substitutes?

- Longitudinal study showed that prolonged milk avoidance in children had lasting detrimental effects on height, weight and persistent osteopenia
- South Africa does not fortify milk with Vitamin D

What is the consequences of using substitutes?

- Milk is an important iodine source in many countries
- Iodine concentration of most cow's milk alternatives such as soy and almond is very low
- Iodine deficiency, especially during pregnancy, affects brain development

What is the consequences of using substitutes?

- Iodine concentration tested in 47 milk substitutes
- Most milk substitutes naturally low in iodine; ~ 2% of cows' milk
- One glass of cows' milk provides ~70μg of iodine (150μg iodine recommended)
- A glass of milk alternative provide ~2μg of iodine

What is does international authorities say?

- Food and Drug Administration (FDA) does not have a definition for the term “natural” or “clean”
- Congress has signed a letter urging the FDA to ban the use of the word “milk”

What is does international authorities say?

- Group claims that nut and grain milks are imitations and should be labelled as such
- 2017, European Union Court of Justice stated that milk, cream, butter, cheese and yoghurt are reserved for animal products only

Arguments for and against the use of alternatives

COW'S MILK

ARGUMENTS FOR

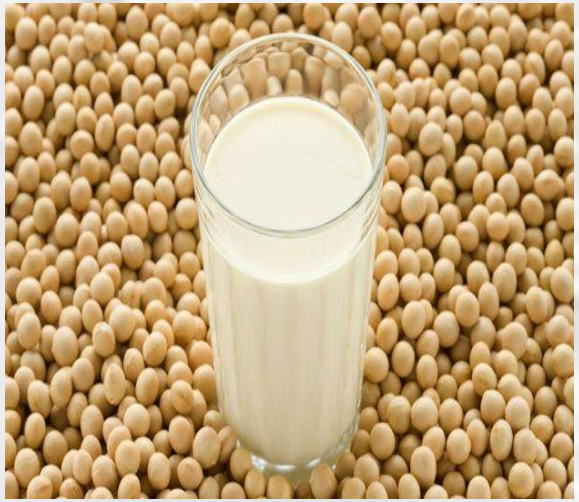
- Immune and inflammatory system support
- Improved bone mass
- Improved blood sugar regulation
- Reduced body fat
- Reduced CVD risk
- Lactose-free milk available

ARGUMENTS AGAINST

- Protein in cow's milk common allergen
- Lactose content

Arguments for and against the use of alternatives

SOYA MILK



ARGUMENTS FOR

- Source of protein, vitamin A, vitamin B-12, potassium, and isoflavones
- Little saturated fat

ARGUMENTS AGAINST

- Phytic acid
- Problem in case of thyroid disorders
- Low calcium and vitamin D
- Fertility problems and lower sperm counts
- Common allergen

Arguments for and against the use of alternatives

ALMOND MILK

ARGUMENTS FOR

- Low in calories and saturated fat
- High in vitamin A and E, Mn, Se, Mg, K and Zn
- Lactose free

ARGUMENTS AGAINST

- Low in protein
- Unfortified, very low in calcium and vitamin D
- May contain carrageenan

Arguments for and against the use of alternatives

RICE MILK

ARGUMENTS FOR

- Lactose free
- Least allergenic of milk alternatives

ARGUMENTS AGAINST

- Lowest nutritional composition
- Low in protein
- High in carbohydrates and GI
- Inorganic arsenic levels

Arguments for and against the use of alternatives

COCONUT MILK

ARGUMENTS FOR

- Contains MCT and K
- Does not increase cholesterol levels
- Rarely causes allergies

ARGUMENTS AGAINST

- Very low in protein
- May contain carrageenan

Conclusion

- Replacing cow's milk with alternatives may cause unintentional nutritional consequences
- Hence milk alternatives should not be considered as a nutritional substitute for cow's milk