The Truth About Dairy Consumption and Your Health

From Lisa Simon, Dairy-Truth.com

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My Personal Story

My journey into plant-based nutrition began when I was going through in vitro fertilisation treatment after experiencing infertility for over a decade. I stumbled across some research into plant-based diets and hormone health. Initially I was very skeptical, believing that it would be difficult to achieve adequate calcium and iron status, as well as meeting my protein needs, without meat and dairy. I decided to do more research and really look into the science, and it was then I realised there was a wealth of evidence showing the benefits of eliminating meat and dairy from the diet.

Eliminating meat and fish was not a problem, but I struggled to give up dairy completely until shortly after my son was born. It was during his first few weeks that I noticed he was becoming increasingly irritable, especially following a feed, and for a couple of hours afterwards. He was also really struggling with constipation and I would have to massage his abdomen firmly for some time before he was able to open his bowels, and even then I would often have to continue massaging until he had finished. I took him to the doctor several times over the course of three weeks, before he was assessed by the paediatric team at our local hospital and was suspected to have cow's milk protein allergy. This was confirmed by a skin prick test, although it was deemed to be very mild. As I was breastfeeding him, I gave up dairy overnight, which was my final step into becoming 100% plant-based, and within weeks he was a different child. He was soiling his nappy regularly and was generally much happier.

When he was 10 months old, his paediatrician advised that we start the milk ladder. This is where small amounts of dairy are introduced over a number of weeks to test the child's tolerance. I was reluctant to do this but was advised that it was important to avoid potentially worsening the allergic reaction if he came into contact with dairy at a later age, so we went ahead.

After two weeks of reintroduction, his gut symptoms started again, and he became noticeably more lethargic. He had just started to crawl but rather than being full of energy, he became listless and would lie on the floor rather than move around. He was also unsettled at night. I immediately decided to put him back on a dairy-free regimen and within weeks he was back to his old self. He was re-tested during his second year and the results came back clear: he had grown out of his dairy allergy, as is

commonplace in children. However, he remains dairy free and plant based, and is now a thriving, very energetic 3-year old. Incidentally, three months after following a fully plant-based diet (three years in December, 2021), my absent menstrual cycle returned and has continued to follow a 28-30 day pattern.

The History of Milk Consumption

Humans have no nutritional requirement for animal milk, and were assumed to have achieved adequate nutritional status for thousands of years before animals became domesticated (1).
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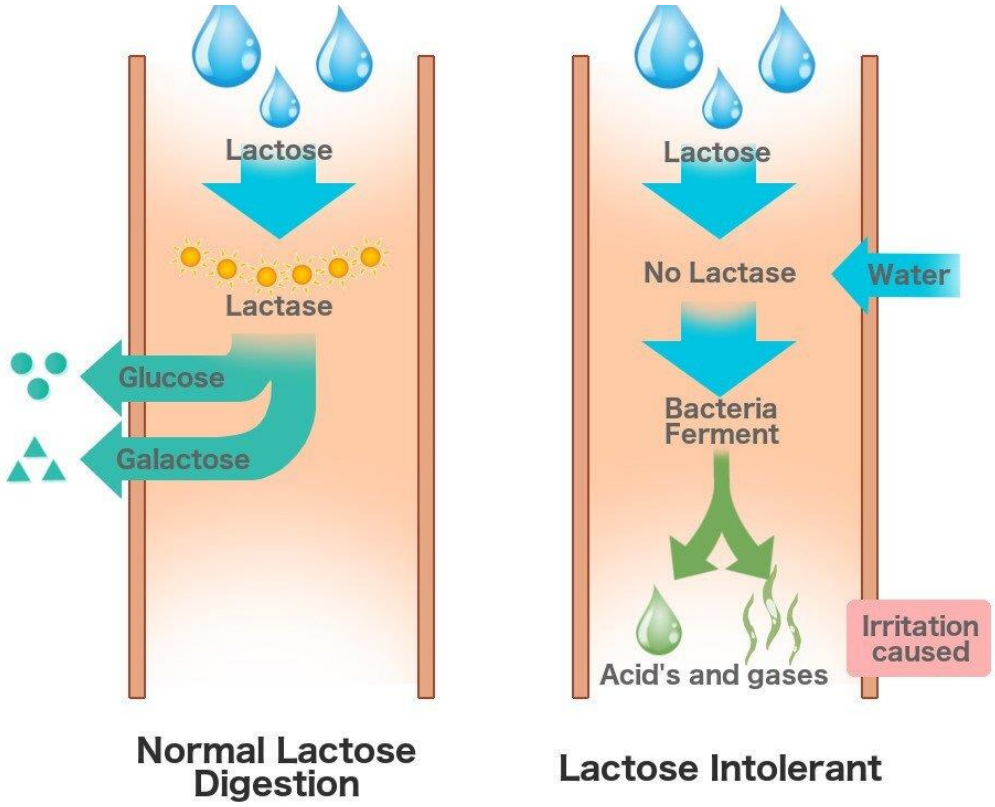


It was during an era commonly known as the Agricultural Revolution, around 10,000 years ago, that Nomadic tribes decided to stop roaming and to settle down in farming communities. Analysis of degraded fat during archeological digs reveal that Neolithic farmers in Northern Europe and Britain may have been the first to milk their cattle for human consumption. This may have begun around 6000 years ago when humans developed a genetic mutation that allowed post-weaned children to digest milk. However, as explained in more detail later in this article, this mutation applies to a small percentage of the population, while lactose intolerance (the natural state for humans) affects a far greater proportion (2).

Fast track many years later to 1992, the first US Department of Agriculture (USDA) dietary food pyramid was released, recommending 2-3 servings of milk and other dairy products should be consumed daily. This was swiftly followed by the ‘Got milk?’ campaign, and the approval by the FDA for the use of artificial bovine growth hormones for commercial use in the US. In 2005, the USDA updated their dietary food pyramid, advising people to consume three glasses of fat-free or low-fat milk

or equivalent dairy products. That same year the Physicians Committee for Responsible Medicine (PCRM) filed a lawsuit demanding lactose intolerance warnings on milk.

In 2015, dairy sales in the US started to decline, with a 7% drop in sales of dairy milk, a figure that reached 11% by 2020, when two major milk producers filed for bankruptcy. Sales of non-dairy milks, on the other hand, continue to rise and see strong growth (2).

The Canadian Food Guide (Canada's Food Guide) was updated in 2019 to eliminate the recommendation of several servings of dairy daily, with the emphasis instead placed on increasing intakes of plant-based proteins, wholegrains, fruits and vegetables. These recommendations reflect the planetary health aspects of dairy production, the non-inclusivity of communities of colour who are usually lactose intolerant, and the basic fact that dairy is not a necessary component of the diet.

In the UK, a vegan Eatwell Guide was published in 2020, which places the emphasis on fruits, vegetables, and whole grains, with the inclusion of plant-based proteins and calcium-rich dairy alternatives. There is also additional information on nutrients that deserve special attention, as well as sustainability tips in line with planetary health concerns. The guide can be found here: The Vegan Eatwell Guide (vegansociety.com)

Nutritional Considerations of Dairy

Dairy is promoted by the industry to be a rich source of protein, calcium, and other micronutrients, including vitamin D and B12. Marketing over the years has focused on its health-promoting components, with its role in children's bone health often emphasised. Omitted from such campaigns are the less healthful components of dairy, including saturated fat, salt, IGF-1, and anabolic hormones (see cancer section below).

While it is not disputed that the micronutrients in dairy are vital to the diets of both adults and children, there are many other ways to obtain these nutrients in a healthier form including from plant sources and supplementation recommended in dietary guidelines.

Calcium is present in low oxalate leafy greens, with an absorption rate of between 40-60% which is actually higher than that of cow's milk (3). The calcium in fortified tofu (look for calcium sulfate in the ingredients) and fortified plant milks is absorbed well and at about the same rate as cow's milk. Other food sources include almonds and their nut butter, figs, oranges, and chia seeds. These plant-based foods also contain micronutrients such as vitamin C, B vitamins, potassium and magnesium in abundance, as well as health-promoting phytoestrogens, antioxidants, fibre, and phytonutrients.

The absence of B12 in a vegan diet is often highlighted as a negative aspect and as an argument not to give up animal products. However, the vitamin is only found in dairy and other animal products due to the animals being supplemented via their feed. It can therefore be argued that supplementing oneself is preferable to ingesting a supplement given to an animal.

While vitamin D is not abundant in a plant-based diet, there are dietary sources and these include fortified foods, and mushrooms when exposed to UV light. However, it is recommended that everyone should take a 10mcg vitamin D supplement during the winter months (October to March), and for pregnant and lactating women, and groups at risk of deficiency, all year around. This advice is not aimed at those on a plant-based diet, but for every person regardless of their dietary choices (4).

Dairy and Cancer

The importance of dairy for calcium and protein is often highlighted by healthcare professionals and in dietary guidelines. However, as the normal cycle of reproduction is manipulated in dairy cows, where they are impregnated once a year to ensure a steady supply of milk, it results in a change in milk composition. Consumers may therefore be exposed to a range of hormones, particularly oestrogens, androgens, and progesterone. Additionally, as the natural function of dairy milk is to nourish and protect young mammals, it contains all essential nutrients but it also contains a range of anabolic hormones. See video "Dairy and Cancer."

One example of such a hormone is insulin growth factor (IGF-1), which cows have been bred to produce higher levels of in order to increase milk production (17). IGF-1 is a natural growth hormone and can be made in nearly every cell of the body, although it is mainly synthesised in the liver. It is

important to keep levels in balance as its ability to drive the growth of cells means that high serum levels are associated with an increased risk of some cancers, including breast, prostate, colorectal and lung (5). This was further highlighted in a meta-analysis in 2016, with strong evidence linking IGF- 1 to prostate cancer development (6).

As cows are often pregnant at the same time they are lactating, the levels of progestins, oestrogens and other milk hormones are greatly increased. Humans are exposed to these hormones upon consumption of cow's milk, which may explain the observed association with several hormone-sensitive cancers (7). Further good quality trials are needed to determine whether there is a causal link. See video "The Effects of Hormones in Dairy Milk on Cancer."

Michels et al (7) found high concentrations of sex steroid hormones, particularly progesterone and androgens (eg. testosterone) are present in cow's milk, with higher fat milk containing higher concentrations of all hormones. When analysing 24-hour urine samples from healthy, post-menopausal women, no significant urinary increase of progesterone was observed after ingestion of the milk. However, there was a significant increase in the oestrogen estrone, and when drinking semi-skimmed milk there was a significant increase in bioavailable estradiol and estriol. The participants had abstained from other dairy consumption and phytoestrogen-containing foods just before and during the three-week study.

Using the same study population, Carruba et al (8) observed in healthy, postmenopausal women that following a Mediterranean style diet reduced urinary oestrogen levels by more than 40% compared to those following a standard Western diet containing high levels of milk and dairy products, meat, and animal fat.

Higher intakes of dairy milk, but not cheese and yoghurt, have been associated with an increased risk of breast cancer, when adjusted for soy intake (9). Furthermore, a recent report of 61,000 women found that not only was cow's milk associated with a 41% increased risk of breast cancer, when it was substituted with soy milk, the risk of breast cancer reduced by 34% (10).

An association between dairy intake and prostate cancer, the most common cancer in men in the UK, has also been found. A large 2017 review (11) evaluated all the data for dairy consumption and cancers and found the link between dairy consumption and prostate cancer was the strongest between dairy and any form of cancer, with milk posing the highest risk. One postulation is the high calcium content of dairy, as this has been shown to increase the risk, as well as calcium supplements which may increase the risk of fatal prostate cancer (12). This is due to high calcium levels suppressing vitamin D levels as vitamin D may act on prostate cells to prevent growth and mutations. Torfadottir et al (13) found that these effects can begin early, with daily milk consumption in adolescence potentially increasing the risk of advanced prostate cancer more than three times compared to those who drink milk less frequently.

Wang et al (14) conducted a meta-analysis to identify any association between dairy intake and non-Hodgkin lymphoma (NHL), due to the increasing global incidence and mortality. They found positive associations between total dairy intake, milk, butter and ice cream, but not yoghurt, with dose-response analysis suggesting a 5% and 6% increased risk of NHL for each 200g increment of total dairy and milk consumed daily. Several mechanisms have been postulated for these findings, including the high saturated fat and protein content of dairy which may cause impaired immune function, and this has been established as a risk factor for NHL. However, these are findings largely from animal studies and more research is needed, along with more prospective cohort studies focusing on specific types of dairy, to add weight to these conclusions.

It is important to note that milk and total dairy consumption, but not cheese or other dairy products, has been shown to reduce the risk of colorectal cancer (15) because of its high calcium content. However, choosing fortified non-dairy milks will provide the same amount of calcium per 100ml as a glass of cow's milk, without any of the associated health risks from dairy.

Dairy and Skin Health

Low levels of IGF-1 have been shown to prevent the occurrence of acne, with a study involving over 24,000 French adults showing that for every glass of milk consumed each day, the risk of developing acne increases by 12%. (16). Data from the EPIC Oxford study found that vegans had 9% lower IGF-1 levels than meat eaters, and 8% lower than vegetarians (17).

Dairy and Bone Health

Osteoporosis is a degenerative condition associated with poor bone mineral density (BMD), with hip fracture being the most serious type of osteoporotic fracture. There are many factors that contribute to such fractures, including BMD, falls, deficiency in specific nutrients such as calcium, vitamin D, magnesium and protein, low physical activity (particularly lack of weight-bearing exercise), smoking and alcohol intake.

Dairy is commonly thought of as being a key food group to ensure adequate provision of calcium and other bioactive nutrients important for bone health thereby reducing the risk of developing osteoporotic fractures. However, dairy consumed in childhood does not predict for future bone health and it is possible to achieve normal growth and development throughout childhood without dairy, as long as the nutrients contained therein are consumed via other sources (18).

Although milk consumption promotes faster growth in children, the potential mechanisms behind this are undesirable. Cow's milk contains the branched-chain amino acids leucine, isoleucine, and valine, and consumption of these increase plasma levels of growth-promoting IGF-1. While tall stature is associated with a lower risk of cardiovascular disease, it is also associated with a higher risk of hip fractures (19), as well as many cancers. See video "Is Milk Good for Our Bones"?

When looking at dairy-free alternatives for children, soy has often been demonised due to poor quality studies suggesting it has a feminising effect on males. This has been shown to be untrue in a recent meta-analysis of 41 clinical trials, where neither soy, nor the compound in soy, were shown to have any negative effects on hormone levels in males (20). There is also evidence that childhood consumption of soy is associated with a reduced risk of developing breast cancer (21), and as relatively few children are allergic to soy protein (and for those who are, the majority outgrow their allergy by ten years of age), soy milk is a useful alternative to cow's milk. Furthermore, it is higher in protein than the majority of non-dairy milks.

A recent meta-analysis (22) found that while some studies showed a reduced risk of fracture with dairy consumption, others showed no consistent associations between milk consumption and risk of hip fracture. It can therefore be concluded that as long as attention is paid to diet quality, there will be no deleterious effects to bone health from eliminating dairy

A recent analysis from the EPIC-Oxford cohort (23) prompted many sensationalised media headlines summarising that vegans are twice as likely to break a hip than meat eaters. However, there were several key factors that explained the increased risk. The vegan group consumed, on average, less that

600mg of calcium daily, with the recommended intakes in the UK being 700mg. The other groups were consuming significantly more than this. Additionally, only about half of the vegans were supplementing with B12 and vitamin D, meaning that it is highly likely that a significant number of them were deficient in one or both micronutrients. As vitamin D is necessary for the absorption of calcium and therefore optimised bone health, it was a huge oversight not to adjust for vitamin D intakes. What this study actually showed was that calcium and vitamin D are vital for bone health, and that with insufficient intakes and poor supplementation, there is a higher risk of fracture. However, this risk is not specific to those on a plant-based diet. Plant-based sources of calcium, such as calcium-set tofu, low oxalate leafy greens, chia seeds, and fortified milks and yoghurts, along with vitamin D supplementation during the winter months will optimise bone health.

Dairy and Parkinson's Disease (PD)

A 2002 study (24) found there may be a higher risk of PD in men with higher intakes of dairy products, with no other food groups found to have an association. Further strength was given to these findings in a 2004 meta-analysis (25), where a dose response analysis found there to be a 17% increased risk of developing Parkinson's with every 200g of milk consumed daily, and a 13% increased risk for every 10g of cheese eaten daily. See video: "Preventing Parkinson's Disease With Diet".

This led to the conclusion that milk and cheese may be positively associated with an increased risk of PD, especially in men. This association was not due to calcium or vitamin D, as these nutrients were only positively associated with PD when they were from dairy sources, not from supplements or non-dairy sources.

Neither was it from fat, as this was neither positively associated with PD when consumed as part of dairy nor other food sources. The authors postulate that the association may be in part due to dairy products being contaminated with neurotoxic chemicals, such as pesticides, as these have been suggested to increase PD risk. However, human exposure is likely to be modest. Another potential explanation is that higher dairy consumption has been linked to lower levels of uric acid. This has been hypothesised to be neuroprotective and linked to a lower risk of PD, however more research is needed.

Lactose Intolerance (LI)

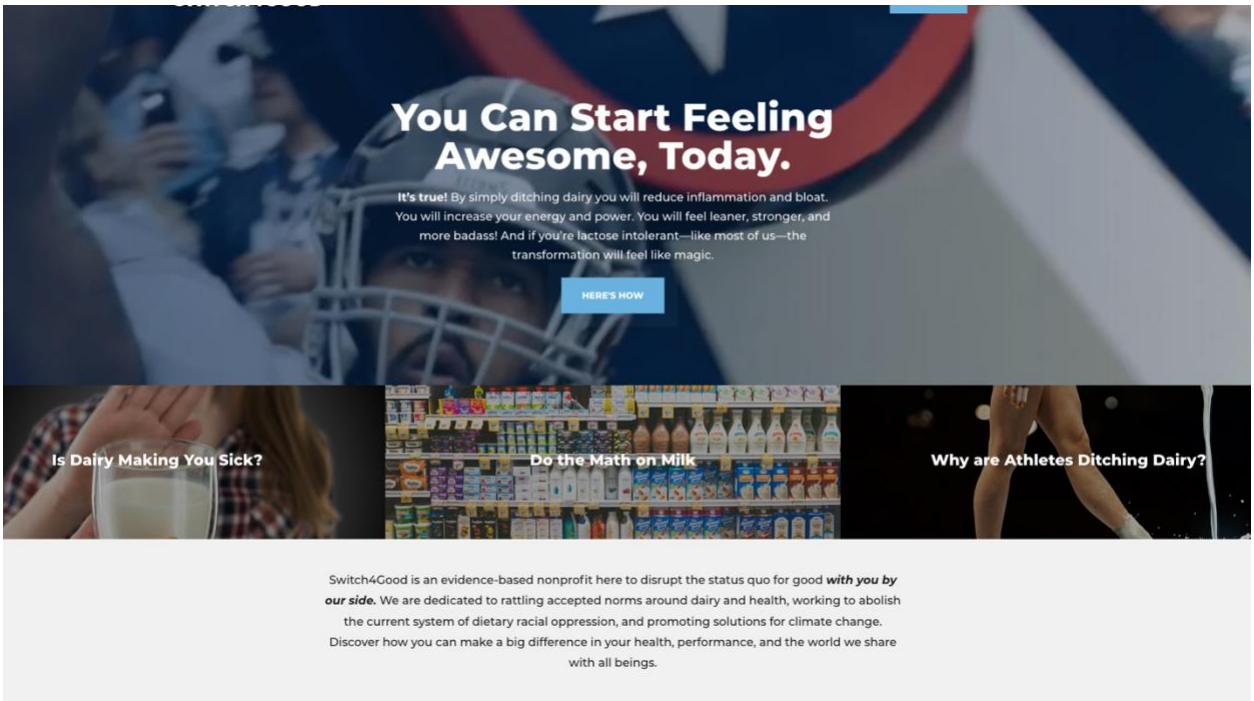
LI affects 65-70% of the global adult population, with most animal species having a post weaning fall in lactase activity. (Lactase is the enzyme that helps us to digest the milk sugar, lactose, in dairy.) This is called lactase non-persistence and symbolises that the animal no longer has a biological need for milk. LI symptoms start to appear in children at approximately 8 years of age (26), and these include bloating, abdominal cramps, flatulence, and diarrhoea. A number of systemic problems have also been associated with LI, including chronic fatigue, rheumatological symptoms, skin disease, and failure to thrive in children (27). LI may also be secondary to conditions such as mucosal damage caused by undiagnosed or poorly controlled coeliac disease, inflammatory bowel, gastrointestinal surgery, or conditions that either result in malabsorption or lead to downregulation of lactase expression in the intestine, the enzyme responsible for lactose absorption.

Around 30% of the global population have what is called lactose persistence, which means they continue to produce lactase throughout their adult life. As previously mentioned, this is likely to have coevolved with the domestication of animals and dairying practice, enabling the digestion of lactose past infancy (28). However, the majority of the global population do not have the ability to do this.

Cow's Milk Protein Allergy (CMPA)

Whereas an intolerance to the sugar found in dairy is not life threatening, CMPA, an allergy to the protein found in dairy, can be. Food allergy is the most common cause of anaphylaxis, a potentially fatal allergic reaction, and an analysis of national data between 1998 to 2018 showed hospital admissions increasing steadily across all ages, from 4.1 to 11.5 admissions per 100 000 population per year (29). Between 1998 and 2018, just over 30% of admissions to hospital in the UK due to anaphylaxis were recorded as being due to a food trigger, with the greatest increase in admissions being among children below the age of 15. Teenagers were shown to be at most risk of a fatal food related anaphylaxis, with children under five most likely to be admitted to hospital with anaphylaxis, however the rates of death were low. Although the most common trigger food listed was peanuts/tree nuts, cow's milk was responsible for 26% of deaths in children and is now the leading cause of food related anaphylaxis in this population group. Concerningly, although a downward trend in deaths caused by peanuts or tree nuts has occurred since 1992, likely due to heightened awareness of the risks posed by these foods, deaths due to cow's milk exposure have increased, with very low levels of exposure sufficient to produce a reaction due to the relatively high protein content (29).

Dairy and Sport's Performance



To learn more about dairy and athletic performance, visit Switch4Good. Switch4Good is an evidence-based nonprofit here to disrupt the status quo for good ***with you by our side.*** *We are dedicated to rattling accepted norms around dairy and health, working to abolish the current system of dietary racial oppression, and promoting solutions for climate change.*

A glass of milk has often been promoted as being the best option for post-exercise recovery, due to its composition of protein, containing all essential amino acids, carbohydrates, micronutrients and water. Studies have claimed that milk may beneficially impact both acute recovery and chronic training

adaptation, with favourable effects on protein synthesis and rehydration, post-exercise muscle soreness and/or function losses, and body composition as a result of reducing subsequent energy intake (30, 31). Within the sport's nutrition community, based on such studies, a popular view is that animal-derived proteins, and whey protein in particular, are more effective than non-dairy protein, such as soya, for muscle building in response to resistance training.

However, a recent meta-analysis (32) does not support these claims as the authors found that despite acute studies showing that when matched for nitrogen content, muscle protein synthesis (MPS) is stimulated to a lesser extent by soya than whey protein, there were no differences in strength and muscle growth in response to resistance training when whey or soya protein supplements were given. This makes sense given that soya also contains all nine essential amino acids. The authors note that many acute studies assess MPS over a 3-5 hour post-exercise period, however it has been shown that MPS can remain elevated for up to three days post-exercise (33). This means that the entire hypertrophic period may not be captured in acute studies and may lead to skewed results. The authors concluded that soya foods and soya protein supplements are suitable sources of protein for muscle anabolism in response to strength training. Such conclusions negate the need for dairy.

Dairy and Alzheimer's Disease (AD)

A 2018 meta-analysis (34) assessed the impact of various fatty acids on AD risk and found that a higher consumption of saturated fat was associated with double the risk of developing dementia, and a 39% higher risk of developing AD.

When conducting a dose-response analysis, they found that a 4g increase in saturated fat, which is equivalent to about 1 cup of whole milk, may increase the risk of AD by 15%, One proposed mechanism for this association is that serum cholesterol levels are raised by higher saturated fat intakes, and this may lead to beta-amyloid plaque formation which is characteristic of AD. There is some evidence that although cholesterol does not usually cross the Blood-Brain Barrier (BBB), oxidized cholesterol may, and high saturated fat diets may result in BBB dysfunction.

Consuming dairy free alternatives, as long as coconut oil-based foods are avoided, means low intakes of saturated fat and no dietary cholesterol. Therefore, based on the above meta-analysis, it can be surmised that the avoidance of dairy and animal products can help reduce the risk of developing AD.

Conclusion

Although the dairy industry continues to market their products as health promoting for both adults and children, there is a wealth of scientific evidence showing the opposite to be true. As detailed in this article, consumption of dairy has been associated with an increased risk of several chronic diseases, including certain cancers, dementia, and Parkinson's Disease. It has also been shown to be the number one cause of anaphylaxis-related fatality in children, and commonly results in gastrointestinal disturbances in adults and children. In relation to sport's performance and bone health, it is the individual nutrients contained in dairy, including calcium, carbohydrates, and protein, that have been shown to be important, rather than the dairy itself, and such nutrients can be easily obtained from dairy alternatives, especially soya products.

It would be remiss not to acknowledge however, that in communities where diet quality is poor, and income is low, the addition of dairy products can provide substantial benefits, particularly in children where otherwise nutrients such as calcium and vitamin D status would be poor. In those circumstances,

optimising the diet via any means is of importance in order to avoid poor bone health, nutritional deficiencies, and childhood diseases such as rickets. For those living in communities where income is higher and where diet quality is adequate, the evidence-base shows that dairy is not a necessary component of the diet, and that many health benefits can be achieved by replacing dairy products with plant-based alternatives.

Lisa Simon, Specialist Dietitian, Plant-Based Health Online

Lisa studied Clinical Nutrition and Dietetics at Cardiff Metropolitan University for four years, before graduating with first class honours in 2014. She has six years clinical experience working in the NHS, providing care to patients in both the inpatient and outpatient setting.

Lisa began her career working in Morriston Hospital in Swansea. After a year of working with patients with a wide range of clinical conditions, she took up a rotational post at the University Hospital of Wales, where she worked in neurology, cardiology and respiratory. She then took up a specialist post in critical care in the Royal Gwent Hospital in Newport, before specialising in gastroenterology in 2016. Lisa left her post at the end of 2019 to set up her own freelance business, however she continues to run weekly gastroenterology clinics virtually for the NHS.

In 2019, Lisa completed the UK's first plant based nutrition and sustainable diets course (Winchester University) and has since gained extensive experience in the field of plant based nutrition. Her special area of interest is male and female fertility and she has developed a strong passion for providing evidence-based, patient centred care in her areas of expertise. She takes a professional but non judgemental approach to offer her patients a truly individualised and holistic treatment plan.

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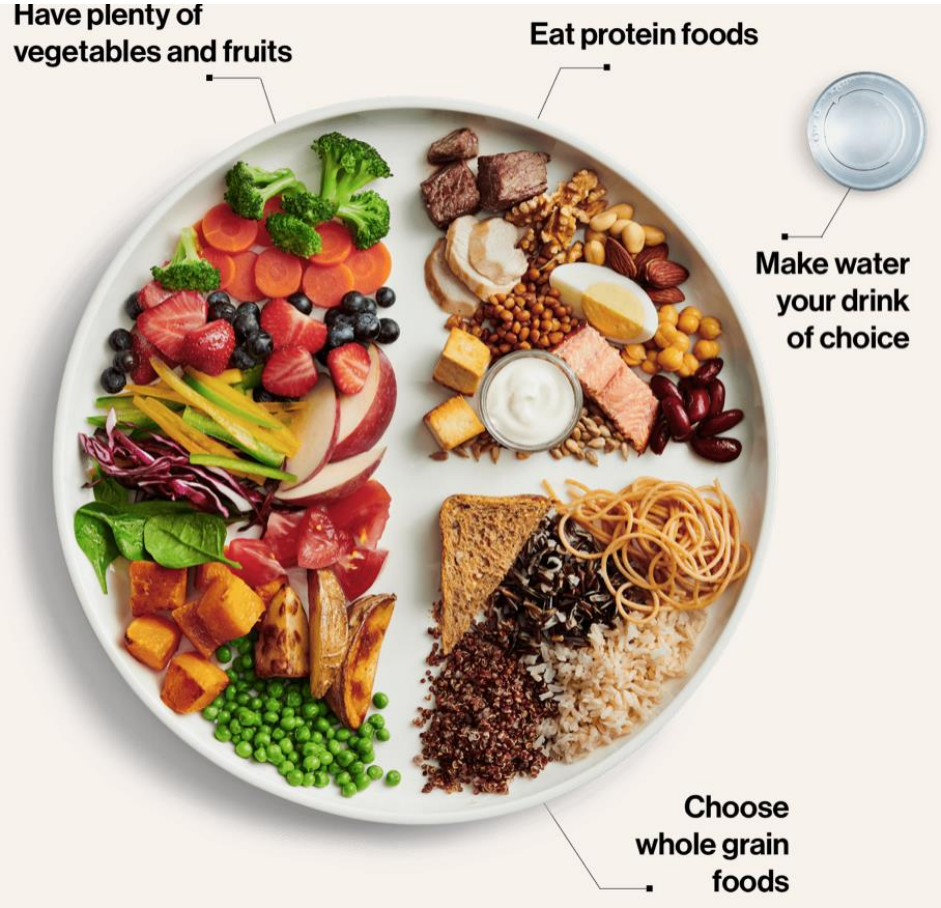

Canada's national food guide.

Foot note: Food Guides

As of 2019, Canada issued an updated food guide - it's first since 2007. Their new food guide ***excludes*** dairy as a recommended food group. An indication that true, independent nutritional research is starting to work it's way into major, dietary recommendations despite the fact they retained eggs as part of their dietary recommendation.

It is our genuine hope that the United States, and other nations where cow's milk is culturally accepted as "food", will begin to accept the evidence that cow, goat and other non-human animal's milk is neither healthy nor physiologically suited for human consumption.