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Cow's milk is promoted as natural, wholesome and healthy. It is none of these things. The saturated fat, animal protein, cholesterol, hormones and growth factors it contains are linked to a wide range of illness and disease including: heart disease, cancers of the breast, ovaries and prostate, acne, asthma, eczema, colic, Crohn's disease, diabetes, dementia, ear infection, food poisoning, gallstones, migraine, multiple sclerosis, autoimmune diseases, osteoporosis, overweight and obesity... the list goes on! Aggressive marketing of the supposed virtues of milk-drinking results in confusion; people don't know who to believe. So why is dairy such a disaster for health and why aren't we talking about it?

The origins of dairy farming

Sheep, cattle and goats were domesticated in parts of the Middle East and central Asia over 9,000 years ago but it is thought that the exploitation of animals for their milk was not practiced until between 6,000-8,000 years ago in north-west Anatolia (Evershed *et al.*, 2008; Salque *et al.*, 2013).

Although this sounds like a long time ago, in evolutionary terms it is very recent history. Hominid (modern human) fossils date back to nearly seven million years ago. If this is represented as a twelve-hour clock, starting at midday and ending at midnight, humans would have started dairy farming less than one minute before midnight!

Modern dairy practises – milking the cash cow

At least two-thirds of cow's milk sold in the UK is taken from pregnant cows. This means that their milk contains oestrogens and progesterone. In fact, there are 35 hormones in cow's milk (Grosvenor *et al.*, 1993)! Just like us, cows don't produce milk unless they have recently given birth. However, unlike humans, the modern dairy cow is routinely impregnated while she is still producing milk – this is how the milk yield is kept high. An intensive cycle of repeated pregnancies follows until she is worn out and her productivity drops,



then she is slaughtered and sold for cheap meat. This intensive physical demand puts a tremendous strain on the dairy cow and, as she gets older, infertility and severe infections causing mastitis and lameness cut her life short. The average lifespan of a modern dairy cow is only about five years – that is after three or four lactations – when naturally she may live for 20 to 30 years.

Dairy Farming Today

Cow's milk production is big business, estimated to be worth £4.4 billion in the UK. That is more than the value of production of beef, lamb, pig, poultry and eggs and around twice the value of the production of fruit and vegetables. There are more than 1.6 million dairy cows in the UK (AHDB Dairy, 2021). Although the numbers of dairy cows are falling year by year, the milk yield continues to rise. In the UK in 1975, a cow produced an average of 13 litres (23 pints) daily but by 2021 it had skyrocketed to 27 litres (47 pints) daily (AHDB Dairy, 2021; Uberoi, 2021). And that's just the average, some cows produce almost twice that much.

What lies beneath...

Cow's milk is perfect for calves but not for people. Nor is buffalo, badger, dog or rat milk – the best milk for babies is human breast milk. Cow's milk contains more than twice as much protein and four times as much calcium as human milk which makes it ideal fuel for the rapid growth of calves. Human babies grow more slowly, but our brain development is rapid, so breast milk contains five times as much brain-boosting polyunsaturated fat as cow's milk. Milk also carries important chemical 'messenger' molecules that instruct the infant's immune systems. These features have evolved over thousands of years and are vital in terms of health and protecting against disease.



Acne – putting milk on the spot

Consuming cow's milk can increase our hormone levels, which may then lead to acne. Recent studies investigating the relationship between milk, dairy products and acne in young people found that milk and dairy product consumption greatly increased the likelihood of acne (Juhl *et al.*, 2018; Aghasi *et al.*, 2019). Having a glass of cow's milk daily increased the risk by 41 per cent.

Research on adult acne and diet revealed that the worst offenders for acne-prone skin are fatty and sugary foods, milk and sweet drinks (Penso *et al.*, 2020). Body-builders and athletes who use whey (milk) protein powders and supplements also tend to suffer from acne (Silverberg, 2012; Simonart, 2012). When they stop using whey powders, acne either disappears or is much more treatable.





Allergies

Cow's milk allergy affects two to three per cent of babies and young children in the UK (BDA, 2021). Symptoms include a runny nose, coughing, blocked ears, excessive mucus in the airways, itchy eyes, rash, vomiting or bloating. More serious symptoms include blood in stools, stomach pain, colic, diarrhoea, eczema or asthma. Children who have cow's milk allergy are more likely to suffer from asthma than others (Jansen *et al.*, 2018).

Allergy or hypersensitivity reaction to milk proteins can cause gastrointestinal bleeding in infants and young children, which, in turn can lead to a lack of iron – potentially resulting in iron deficiency anaemia.

Cancer

Currently one in two people in the UK born after 1960 will develop cancer during their lifetime (Smittenaar *et al.*, 2016). Up to 40 per cent of these cancers could be prevented by lifestyle changes (Brown *et al.*, 2018).

A poor diet may be responsible for a third of all cancer deaths and is the second largest preventable risk factor for cancer, coming closely behind smoking. Western diets rich in animal-based foods, sugar and highly processed food products, can increase the risk of cancer. On the other hand, wholegrain plant-based diets lower the risk.

A large-scale study found that vegans had a 19 per cent lower risk of cancer than meat-eaters (fish-eaters had a 12 per cent lower risk and vegetarians 11 per cent lower) (Key *et al.*, 2014).

Taken together, evidence suggests that plant-based diets are a useful strategy for reducing cancer risk. The World Cancer Research Fund (2018) says that wholegrains, vegetables, fruit and beans should make up the most of our diet.

IGF-1 Signalling trouble

Milk taken from pregnant cows (and cows that have recently given birth) contains considerable levels of hormones which may be linked to some cancers. In addition to that, cow's milk increases circulating levels of the growth hormone IGF-1 by stimulating its production in your body (Harrison *et al.*, 2017; Romo Ventura *et al.*, 2020; Melnik, 2021). A study from the *British Journal of Cancer* found that vegan men had a nine per cent lower IGF-1 level than vegetarians and meat-eaters (Allen *et al.*, 2000).

IGF-1 encourages the growth of human cancer cells and increased IGF-1 levels are linked to cancers of the breast, ovaries and prostate (Harrison *et al.*, 2017; Ding *et al.*, 2019, Fraser *et al.*, 2020). Professor T. Colin Campbell, Jacob Gould Schurman

Professor Emeritus of Nutritional Biochemistry at Cornell University says that IGF-1 may turn out to be a predictor of certain cancers in the same way that cholesterol is a predictor of heart disease (Campbell and Campbell, 2016).

IGF-1 from cow's milk can easily be avoided by eliminating all dairy foods from the diet. Whether it is the saturated animal fat, the calcium, the hormones in milk or the hormones we produce in response to drinking milk; the fact remains that a high dairy diet may increase the risk of some cancers.

Breast cancer

Breast cancer rates in the UK have risen steeply since the 1970s; the lifetime risk is now one in seven. Only five to 10 per cent of breast cancer cases are caused by genes, most cases are caused by lifestyle and environmental factors.

Research suggests that nearly a third of all breast cancer deaths in the UK are caused by preventable lifestyle factors – the biggest ones are excessive alcohol consumption, overweight/obesity and lack of exercise (Goon *et al.* 2022). Higher levels of body fat tend to increase oestrogen levels and that's also a risk factor for breast cancer (Bhardwaj *et al.*, 2019). At the same time, a typically meat- and dairy-rich Western-style diet also increases the levels of oestrogens. Milk and dairy products are the main source of oestrogens in people's diet, accounting for 60-70 per cent of all oestrogens consumed (Malekinejad and Rezabakhsh, 2015). And because dairy consumption also leads to higher IGF-1 levels in the body, another risk factor for breast cancer (Ding *et al.*, 2019), it increases breast cancer risk in multiple ways.

Changing the diet could prevent and/or limit the progression of the disease. High-fibre, wholesome plant-based diets may lower the risk of the disease by up to 46 per cent (Dandamudi *et al.* 2018). Soya foods can also reduce breast cancer risk and improve the prognosis in women with breast cancer (Rizzo and Baroni, 2018; Boutas *et al.*, 2022). A dairy-free, plant-based diet can reduce the risk factors associated with breast cancer and may improve outcomes in those who have been diagnosed with the disease.

Prostate cancer

The lifetime risk of prostate cancer for men in the UK is now one in six (Cancer Research UK, 2022). Only a small percentage – between five and 10 per cent – of cases are linked to genes. So, like breast cancer, the majority of cases are caused by environmental and/or lifestyle factors. Obesity and higher levels of IGF-1 increase the risk and rates are higher in countries consuming a typical Western diet. Men who eat lots of saturated animal fats



(found in red meat such as beef, lamb and pork, eggs and dairy produce such as butter, whole milk, cheese and cream) have an increased risk of getting the disease (Oczkowski *et al.*, 2021).

Diets high in calcium and dairy protein may also increase the risk of prostate cancer because they increase IGF-1 levels – a known risk factor for prostate cancer (Harrison *et al.*, 2017; Oczkowski *et al.*, 2021). The oestrogen from cow's milk may play a role in prostate cancer too (Vasconcelos *et al.*, 2019).

On the positive side, a plant-based diet may help prevent or slow prostate cancer progression and improve prognosis. In addition, specific nutrients found in plant foods, including selenium (Brazil nuts), vitamin E (sunflower seeds, vegetable oils), isoflavones (soya) and lycopene (tomatoes, tomato sauce) may help reduce the risk (Oczkowski *et al.*, 2021).

Crohn's disease

Crohn's disease is a debilitating, chronic inflammation of the digestive system that is incurable. Once it develops, it requires a specific diet and can cause many complications. Crohn's disease sufferers also have an increased risk of bowel cancer (Majumder *et al.*, 2022).

It's linked to dairy foods through the MAP bacterium (*Mycobacterium avium* subspecies *paratuberculosis*) that causes Johne's disease in cattle and other ruminants. MAP infection is widespread among cattle and is found in commercial cow's milk (it survives pasteurisation) and goat's milk (Naser *et al.*, 2014; Dow and Sechi, 2019; Zarei-Kordshouli *et al.*, 2019). That means you can get infected by consuming milk or various other dairy products but also by inhaling MAP in fine water spray from rivers contaminated with cow manure. The infection doesn't cause Crohn's in everyone but if you have a certain genetic make-up that makes you susceptible, MAP may trigger the disease (Naser *et al.*, 2014). It's also been suggested that it plays a role in the development of type 1 diabetes (Dow and Sechi, 2019).



Heart disease

Butter, ghee, cream, whole milk, high-fat cheese, dairy desserts, milkshakes, as well as all meat, contain high amounts of saturated fat which raises cholesterol levels in the blood. If you eat these foods daily, it puts you at risk of heart disease.

In a study where each group of people ate 50 grams of different fat daily – butter or vegetable oils – for four weeks, the participants who ate butter had the worst cholesterol results (Khaw *et al.*, 2018). Another study tested the effect of adding high-fat dairy products and butter to people's diets and it increased everyone's cholesterol levels (Bergeron *et al.*, 2019).

Studies found that replacing dairy fat with plant-based unsaturated fats and wholegrains could greatly reduce the risk of heart disease (Chen *et al.*, 2016; Liu *et al.*, 2017; Yu and Hu, 2018). This is important for everyone but particularly for people at risk of heart disease – those who eat the most saturated fats have up to 80 per cent greater risk of heart disease compared to people who eat mostly unsaturated (plant) fats (Guasch-Ferré *et al.*, 2015).

Animal protein – whether from dairy, meat or eggs – has also been linked to an increased risk of heart disease (Bernstein *et al.*, 2010). A large study found that people who ate mostly plant protein and little animal protein had a 27 per cent lower risk of dying from heart disease compared to people who ate the most animal protein (Budhathoki *et al.*, 2019).

Vegans and people who eat predominantly wholefood plant-based diets have lower blood pressure and cholesterol levels than all other diet groups and a much lower risk of heart disease – 25-57 per cent (Bradbury *et al.*, 2014; Le and Sabaté, 2014; Appleby and Key, 2016; Dinu *et al.*, 2017; Benatar and Stewart, 2018; Kahleova *et al.*, 2018; Korakas *et al.*, 2018; Matsumoto *et al.*, 2019).

Diabetes

Type 1 diabetes

The incidence of type 1 diabetes has been rising worldwide, with a rapid rise in the number of children affected (Abela and Fava, 2021). Type 1 diabetes is the form of the disease where little or no insulin is produced.

When young children with genes that make them susceptible to diabetes drink cow's milk, the milk proteins may trigger an autoimmune reaction which accidentally destroys the insulin-producing cells in the pancreas (Chia *et al.*, 2017). It's been suggested that it's not just milk proteins that the body attacks but also the bacteria in milk – the MAP (*Mycobacterium avium* subspecies *paratuberculosis*) that is often present in pasteurised milk (Niegowska *et al.*, 2016; Songini *et al.*, 2017). The immune system attacks these invaders but because the insulin-producing cells share a similarity with them, they are destroyed too.

Type 2 diabetes

Type 2 diabetes – the more common type – usually develops in adulthood and unhealthy diets and lifestyles are a major risk factor. It typically starts with body cells developing insulin resistance – they stop responding to insulin that your pancreas produces.

As many studies have demonstrated, diets high in meat, saturated fat and processed foods (Western style diets) cause the accumulation of tiny droplets of fat in your muscle and liver cells. When there are too many of these droplets, they interfere with the cell's metabolism so it stops being able to react to insulin correctly, causing insulin resistance (Sparks *et al.*, 2005; Morino *et*



et al., 2006; Consitt *et al.*, 2009). Meat and fatty dairy products are major sources of saturated fat in the Western diet.

Vegans have up to 50 per cent lower risk of type 2 diabetes (Appleby and Key, 2016; Salas-Salvadó *et al.*, 2019). And even if you already have the disease, a healthy vegan diet low in fat and high in wholefoods can help reverse it (McMacken and Shah, 2017).

Lactose Intolerance

In 1836, after returning from the Beagle, Charles Darwin wrote: “I have had a bad spell. Vomiting every day for eleven days, and some days after every meal.” Darwin suffered for over 40 years from long bouts of vomiting, stomach cramps, headaches, severe tiredness, skin problems and depression. A number of researchers now suggest that he suffered from lactose intolerance. His case is a good example of how easily lactose intolerance can be missed.

All mammalian milk contains the sugar lactose and most humans gradually lose the ability to digest it during childhood. Globally, about 70 per cent of adults are lactose-intolerant (Bayless *et al.*, 2017). The fact that some people can digest lactose in adulthood is the result of genetic mutations that occurred in Europe, Asia and Africa several millennia ago and spread among the populations. However, being unable to digest lactose in adulthood is perfectly normal.





Allergy vs intolerance

Lactose intolerance should not be confused with cow's milk allergy, they are entirely different. Cow's milk allergy is where the immune system reacts to cow's milk proteins. Lactose intolerance is where the body cannot digest lactose – the sugar in milk.

Taking the pus!

Cow's milk contains pus. Intensive farming ensures that, at any given time, out of 100 dairy cows, 38-50 have mastitis – a painful infection of the udders (Cattle Health and Welfare Group, 2020). Pus is produced in the fight against bacterial infection in diseased udders. Regulations permit up to 400,000 cells per millilitre. So one teaspoonful of cow's milk contains up to two million pus cells!

Bone health

A recent review of studies on milk, dairy products and bone health looked at whether milk is good, bad or neutral for our bones (Wallace *et al.*, 2021). They found that milk and dairy products had a beneficial effect only on those people whose calcium intake was otherwise low. In others it had no benefit or even had a negative effect on bone health (Wallace *et al.*, 2021). The message is clear – it's important to take in enough calcium and vitamin D but it absolutely doesn't have to be from dairy products.

When it comes to calcium, we need enough – around 700 milligrams daily – but not too much. Low calcium intakes increase the risk of bone fractures but so do high intakes (Fang *et al.*, 2016). Your daily calcium intake shouldn't go above 2,000 milligrams. When you make calcium-rich plant foods a part of your daily diet,

you'll ensure you have enough calcium but there's no risk of getting too much. These are the best sources: dark green leafy vegetables (broccoli, kale, watercress and cabbage), tofu, beans, seeds (especially sesame and tahini – sesame seed paste) and nuts (especially almonds), oranges, dried figs and fortified plant milks.

Research shows that a diet rich in fruit and vegetables, pulses, calcium-fortified milk alternatives, nuts and wholegrains is excellent for bone health because it provides a wealth of nutrients essential for bones. Lastly, physical activity is as important for bone health as a healthy diet. Bones need to be stimulated in order to grow, mend and become stronger (Weaver *et al.*, 2016; Movassagh *et al.*, 2018)!

Health organisations claim that most cases of heart disease and type 2 diabetes, and many cancers can be avoided by making our diets healthier, increasing physical activity and stopping smoking. A healthy diet contains a wide range of fresh fruit and vegetables, wholegrains, pulses, nuts and seeds. It is rich in fibre, vitamins, minerals, antioxidants and polyunsaturated fats that protect against a number of illnesses and diseases. Milk and dairy products are simply unnecessary and can harm our health.

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