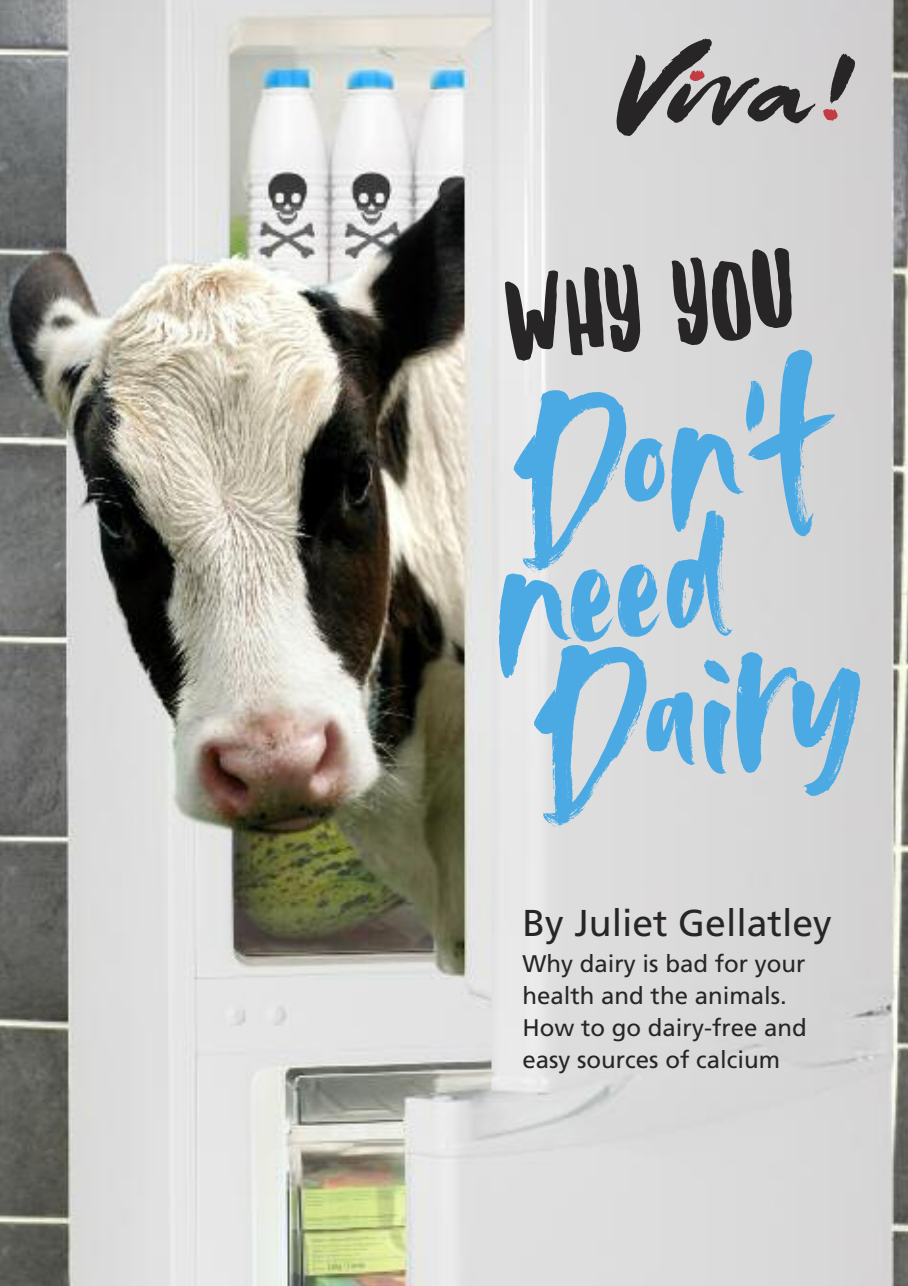

Viva!

WHY YOU Don't need Dairy

By Juliet Gellatley

Why dairy is bad for your health and the animals. How to go dairy-free and easy sources of calcium

Donate monthly online at
viva.org.uk/donate-cows
or call **0117 944 1000** (Mon-Fri, 9-5)

Contents

OUR WEBSITES

viva.org.uk/scarydairy all about being dairy-free including dairy-free alternatives, animal welfare, health and nutrition
viva.org.uk everything about going and being vegan and our campaigns to save animals and the planet
viva.org.uk/health health and nutrition resources and campaigns
veganrecipeclub.org.uk hundreds of tasty dairy-free, vegan recipes
viva.org.uk/V7 viva.org.uk/V30 sign up for a week or a month free. Daily help with breakfast, lunch and evening meal ideas and recipes, plus nutrition tips. There's also a CAN'T COOK, WON'T COOK! version
myvegantown.org.uk discover local eateries that offer vegan options and find out what events are happening across the UK

ABOUT VIVA!

Viva!

Viva! is a vivacious, vibrant campaigning charity that fights animal cruelty and slaughter. We have worked for many years on the ground-breaking White Lies campaign, relaunched as Scary Dairy. We expose the impact dairy has by investigating major players in the industry and researching the science on how milk affects our health.

Viva! also loves helping people to take the step to a healthy, humane diet and so has wonderful, inspirational but, most of all, useful resources, including viva.org.uk/easyvegan

MORE ON BEING DAIRY-FREE

White Lies: a mighty scientific report on the impact of dairy on our health; fully-referenced viva.org.uk/materials/white-lies
Dark Side of Dairy: a report on the welfare of cows and their calves in the dairy industry; also fully-referenced viva.org.uk/materials/the-dark-side-of-dairy-report
Everyone's Going Dairy-Free: an easy-to-read shopping, food tips and delicious recipe guide viva.org.uk/materials/everyones-going-dairy-free
Wallcharts: including *My calcium-rich foods reminder* from viva.org.uk/materials/calcium-rich-foods-wallchart and *What I need each day for good health* from viva.org.uk/materials/what-i-need-each-day

All the above and a lot more resources can be found at viva.org.uk/resources and if you would like to try some dairy-free treats or find an interesting book or cookbook, go to vivashop.org.uk

THANK YOU...

…to my fine colleagues and friends, Dr Justine Butler and Veronika Prošek Charvátová, for their excellent research on dairy. To our investigators – brave souls, you know who you are! Also to Tony Wardle, for patient editing!

ABOUT JULIET

Juliet Gellatley founded Viva! in 1994 – a vibrant, campaigning group with a health and nutrition arm, Viva! Health. Viva! is the biggest vegan organisation in Europe.

Juliet has created and launched numerous campaigns fighting animal cruelty and promoting veganism. She's written several reports, guides and books. She investigates animal cruelty first hand – including the largest investigation to date of dairy farming in the UK – and uses her footage to bring the truth to millions, eg see viva.org.uk/faceoff.

She has given hundreds of talks and media interviews.

Juliet is a qualified nutritional therapist and has a degree in zoology and psychology as well as diplomas in direct marketing and nutritional therapy. She is a Pride of Britain Winner for Animal Welfare.

WHY YOU don't need Dairy

By Juliet Gellatley BSc, DIP CNM, founder & director, Viva!

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TAKE A DEEP BREATH. SIT BACK AND RELAX.

What I'm about to say may shake a few entrenched beliefs but stay with me. It'll be worth it!

Drinking milk is unnatural

'Hey, what!', you may be thinking, 'drinking milk is as natural to people as purring is to a cat'.

Drinking milk is the most innate thing in the world – if you're a baby and you're suckling from your mum, that is. Like all 6,000 or so species of mammals on this planet, we have evolved to drink the milk of our mothers until weaned. But we are the only mammal to drink milk after weaning (apart from animals we control of course) – and certainly the only one to drink the milk of another species!

The dairy industry is clever – it pays well to attract clever people! It uses the strong emotional bond we have with milk and twists it into something cruel and warped. Into false logic. They're able do this because our attachment to milk is hardwired. It is our first food and breastfeeding is extremely intense, basic, pleasurable and instinctive – and is about survival. But taking milk from a cow, goat or sheep is not natural and was never meant to be our first food or eaten at any point in our lives.

Like us, cows have a nine-month pregnancy. Also like us (and all mammals), they produce milk only after giving birth to their baby.

I SUCKLED FROM MY DOG TODAY

If this sounds strange, think how you'd feel if your friend told you that they suckle from their pet dog or cat. You walk into their house and they offer you a cuppa. You're parched and gratefully say yes, and they bend down to their lactating dog or cat and express milk from them for your tea.

Next they tell you that the puppies or kittens are taking too much of their mother's milk so they have decided to kill the males and keep the females for future milk production.

Whether or not this idea shocks you (and I hope it does), my point is that this behaviour is most definitely not natural! It would be closer to nature's intentions if we suckled from adult women who have given birth rather than take the milk of a rabbit, dog, cat, horse, cow, elephant, gorilla, tiger, hedgehog, bear, squirrel, walrus or dolphin… because at least that milk would be from the same species.

But we've drunk milk for yonks!

Although cattle, sheep and goats were domesticated in parts of the Middle East and central Asia over 9,000 years ago, there is no evidence that these animals were milked. Written texts, paintings, drawings and analysis of dairy fat residues on pottery fragments suggest that people started exploiting these animals for milk between 6,000 and 8,000 years ago (Evershed *et al.*, 2008; Salque *et al.*, 2013).

Although this sounds like a long time ago, in evolutionary terms it is the blink of an eye. The fossils of modern humans (hominins) date back nearly seven million years and if that were represented as a twelve-hour clock, starting at midday and now at midnight, we would have begun dairy farming less than one minute ago.

Cow's milk is meant to get a calf to triple his or her weight within a year to an adult weight of a whopping 300-400 kg. We, on the other hand, are the slowest growing mammal, taking about 14-18 years to reach adult weight.

Also, early dairy farming was practised on a tiny scale compared to today, with most societies eating very little, in stark contrast to our post-Second World War binge on dairy. In the last 30 years, the average herd size in the UK has more than quadrupled. The cows themselves are being pushed beyond their biological limits, selectively bred to produce more and more milk. 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.

Cow's milk: ideal for calves, not humans

The composition of milk varies widely from animal to animal, providing the perfect first food for the young of that species. A seal's milk is extraordinarily fatty (50 per cent fat) so that seal pups can grow very quickly, depositing a thick layer of blubber that will protect them from the cold and sustain them as they learn to hunt.

Just as we are different from seals, we are not exactly the same as cows either! It won't surprise you, then, that cow's milk is very different from human milk – which is why we mustn't give ordinary cow's milk, condensed milk, dried or evaporated milk to a child under the age of one. If a human baby is given cow's milk, it has to be changed into a formula that attempts to replicate human milk.

Cow's milk is meant to help a calf grow very rapidly indeed, reaching 47-63 stone (300-400 kg) within a year. We, on the other hand, take about 14-18 years to reach adult weight (a woman of 5'4" has an average weight of about 10 stone 3 lbs (65 kg); a 6' man has an average weight of 13 stone (83 kg). So, we have very different rates of growth and while cow's milk and human milk contain a similar percentage of water, the relative amounts of fat, carbohydrate, protein, vitamins and minerals vary widely. So, let's look at four of these main nutrients (for more information see the *White Lies* report at viva.org.uk/materials/white-lies).

The weight gain of calves during their first year is nearly 40 times greater than that of breastfed human infants. One big reason why cow's milk and human milk are so different.

How does cow and human milk differ?

1 Fats

Cow's milk is lower in polyunsaturated fats than human milk. Lower levels of polyunsaturated fats show just how unnatural cow's milk is for our babies because these are the very fats which are essential for human brain development! In humans, the brain develops rapidly during the first year of life, growing faster than the body and tripling in size by the age of one. Brains are largely composed of fat and early brain development requires a sufficient supply of polyunsaturated fats called omega-3 and omega-6 and both are present in greater amounts in human milk.

Cow's milk is higher in saturated fats than human milk. A swift increase in body size is more of an imperative for cows than rapid brain development, so cows produce milk that is high in body-building saturated fats.

2 Calcium

The calcium content of cow's milk (120 mg per 100 ml) is nearly four times greater than that of human milk (34 mg per 100 ml). There is a reason for this discrepancy – calves grow much more quickly and have a larger skeleton than human babies and therefore need much more calcium (FAO, 1997).

Cow's milk is specifically designed to meet this high demand and is another reason why whole cow's milk is not recommended for infants under 12 months. Calcium inhibits the absorption of iron. Also, excess calcium and other minerals in cow's milk, upset the kidneys in human babies and can lead to severe dehydration. Although human milk contains less calcium, it is more easily absorbed than that found in cow's milk (Greer and Krebs, 2006).

3 Protein

There is a bit of an obsession in our society with protein ("but are you getting enough?"), so you may be surprised to discover that human breast milk has the lowest percentage of protein of all mammals on our planet (Bounous *et al.*, 1988).

The amount of protein in milk is linked to the amount of time it takes that particular species of animal to grow in size. You'll have guessed by now that calves need more protein for their fast growth rate than human babies! That's why cow's milk has three times as much protein as human breast milk. The weight gain of calves during their first year is nearly 40 times greater than that of breastfed human infants! The excessively high protein in cow's milk puts a strain on human babies' kidneys, again risking severe dehydration. The protein, casein, much higher in cow's milk than human's, is linked to diabetes type 1. And in fact, cow's milk-based infant formula contains high protein and hormone levels which are also linked to human babies being overweight or obese (Melnik *et al.*, 2012).

How low can you go?

Examples of percentage of protein in mammalian milk – humans are lowest

Animal	% protein
Whale	13.6
Mouse, house*	12.5
Lion*	11.8
Seal, grey	11.2
Cat	11.1
Reindeer	10.3
Bear, polar	10.2
Dog	9.5
Mink	7.0
African buffalo*	6.3
Kangaroo	6.2

Animal	% protein
Sheep	5.4
Elephant	4.9
Cow (skimmed)**	3.5
Bat (large flying fox)	3.1
Goat	3.1
Horse	2.7
Monkey	2.1
Donkey*	1.7
Mountain gorilla*	1.4
Human***	0.8-1.3

*,**,***Sources on page 109

4 Iron

Cow's milk contains very little iron, which is another reason why it is unsuitable for infants under the age of one year. The UK's Department of Health has advised that babies are not given cow's milk before the age of 12 months. One day (I'm an optimist), that advice will apply to all ages.

If you are erring on the side of caution (or disbelief!), here's a 2022 quote from the American Academy of Paediatrics on their website healthychildren.org, aimed at parents:

"Cow's milk contains high concentrations of protein and minerals, which can stress a newborn's immature kidneys and cause severe illness at times of heat stress, fever, or diarrhoea. In addition, cow's milk lacks the proper amounts of iron, vitamin C, and other nutrients that infants need. It may even cause iron-deficiency anaemia in some babies, since cow's milk protein can irritate the lining of the stomach and intestine, leading to loss of blood into the stools. Cow's milk also does not contain the healthiest types of fat for growing babies." For these reasons, your baby should not receive any regular cow's milk for the first twelve months of life. (American Academy of Paediatrics, 2022.)

Milk – it's got the lot!

75-90 per cent of milk in the UK is from pregnant cows

A cow is milked for the first seven months of her nine-month pregnancy and the cycle recommences shortly after each birth, ensuring milk contains many biologically active molecules.

Milk is a hormone cocktail

In a typical glass of milk or bite of cheese, there are 35 hormones, including IGF-1, oestrogen and progesterone, adrenal, pituitary, hypothalamic and other hormones. (Grosvenor *et al.*, 1993).

IGF wot not?

IGF-1 stands for insulin-like growth factor-1. It is a growth hormone that controls growth and development in both cows and people but each species has very different rates of growth. IGF-1 in cow's milk makes us produce more of our own IGF-1. Even small increases in our levels of IGF-1 increase the risk of several common cancers, including breast, prostate, lung and colon (Malekinejad and Rezabakhsh, 2015; Melnik and Schmitz, 2017).

Higher intakes of cow's milk and dairy products are linked to raised levels of IGF-1 (Romo Ventura *et al*., 2020; Melnik, 2021). For example, increasing cow's milk intake from 200 to 600 ml a day produced a 30 per cent increase in IGF-1 in young boys (Hoppe *et al*., 2004).

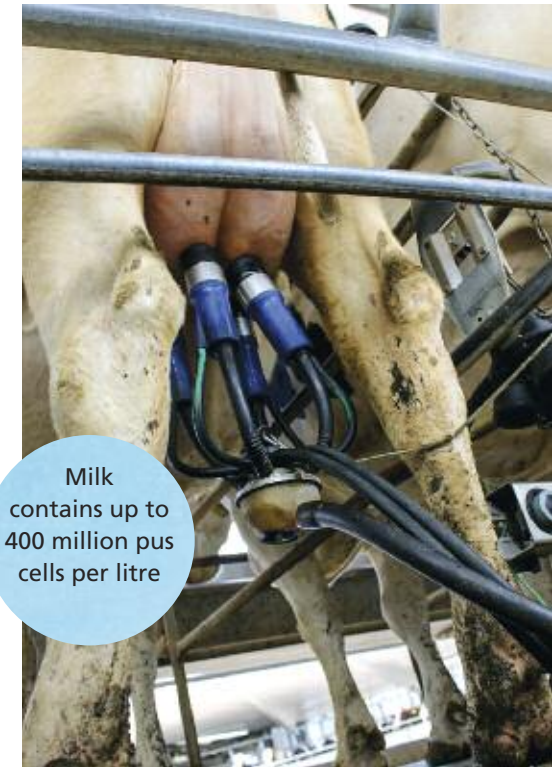
Whereas, vegetable and fruit consumption is linked to lower levels of IGF-1. Not surprising then that vegans have lower levels of IGF-1 circulating in the blood (Allen *et al*., 2000; Allen *et al*., 2002).

The research is clear – cow's milk and dairy products increase levels of IGF-1, which in turn increase the risk of many cancers.

Pus in Milk

Another undesirable component in milk is pus (yes, that creamy-yellow stuff that oozes out of infections)! Milk containing up to 400 million pus cells per litre is legally allowed to be sold for human consumption – even higher levels in goat's milk. Why so much? Because modern, intensive dairy farming ensures that 30 per cent of British dairy cows have mastitis – a painful infection of the udders. Pus is a product of the cow's almost constant fight against bacterial invasion and some of it finds its way into her milk.

Next are some of the health problems linked to dairy foods together with a sample of the scientific research that unearthed them.



Milk contains up to 400 million pus cells per litre

Health

Lactose Intolerance

Many people avoid cow's milk and dairy products because they are lactose intolerant – a condition which directly stems from drinking milk after weaning, contrary to what nature intended.

The main sugar in all mammalian milk is called lactose and for it to be digested, it must be broken down into its component parts: glucose and galactose. This is done in the small intestine by the enzyme lactase. Glucose can then be used to make energy. Although babies and toddlers have lactase available to digest lactose, it is lost in most people after weaning, commonly after the age of two.

In the absence of lactase, lactose is fermented by bacteria and bubbles away in the large intestine, producing gases and a wide range of potential toxins. Symptoms that result from it can include diarrhoea, a bloated and painful stomach and, on some occasions, nausea and vomiting. Other symptoms may include muscle and joint pain, headaches, dizziness, lethargy, difficulty with short-term memory, mouth ulcers, allergies (eczema, rhinitis, sinusitis and asthma), cardiac arrhythmia, sore throat, increased frequency of urination, acne and depression (Lomer *et al*., 2008).

In global terms, lactose intolerance is extremely common as 70 per cent of the world's population do not produce lactase after infancy (Bayless *et al*., 2017).

You may wonder why some ethnic groups have relatively little lactose intolerance – it is because of a random genetic mutation. However, being able to tolerate lactose doesn't make dairy good for you!

Prevalence of lactose malabsorption or lactase non-persistence

Chinese (lactase non-persistence)	100%
Vietnamese	100%
Japanese	100%
Bantu, Uganda	100%
Peru, non-Caucasian	94%
Iraqi Jews	93%
Australian Aborigine	84%
Nigeria Yorba	83%
Ashkenazi Jews	83%
Moroccan Jews	82%
US Native American	81%
Brazil, general	80%
Chile, general	80%
African American	75%
Egypt, general	73%
Germany, general	70%
Hungary, general	56%
Mexico, general	53%
Northern Italy	52%
Fulani	50%
Greece, general	45%
UK White	22%
Finland	17%
US White, general	15%
Central Italy	15%
Irish	14%
Danes	12%
Swedes	10%

(Source: Bayless TM, Brown E, Paige DM. 2017. Lactase Non-persistence and Lactose Intolerance. *Current Gastroenterology Reports*. 19 (5): 23.)

Lactose intolerance is unpleasant, sometimes in the extreme, but it is not a killer. However, dairy is also linked to more sinister diseases.

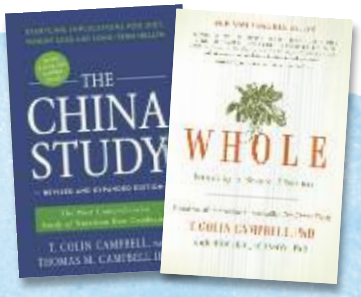
THE BIG C: DIET AND CANCER

Professor T Colin Campbell has been at the forefront of nutrition research for decades. His legacy, *The China Study*, is the most comprehensive study of health and nutrition ever conducted. Colin Campbell is Jacob Gould Professor Emeritus of Nutritional Biochemistry at Cornell University, he has received more than 70 grant-years of research funding and has authored more than 300 scientific papers. *The China Study* was the culmination of a 20-year partnership between Cornell University, Oxford University and the Chinese Academy of Preventive Medicine.

Why am I telling you so much about the Prof? Because his family background was in dairy farming and he grew up convinced that dairy was essential for good health yet it is his extensive research that leads him to believe that casein actually promotes cancer.

What is casein?
It is the main protein in cow's milk

WANT TO KNOW MORE?



Read an excellent book on the impact of animal products on our health: *The China Study* by T Colin Campbell and Thomas M Campbell (updated 2016). Also, its fascinating follow up, *Whole*, by T Colin Campbell and Howard Jacobson, about the impact of diet on health and why the establishment ignores and twists the truth! Available from vivashop.org.uk/collections/books.

THREE STAGES OF CANCER

Cancer develops in three stages: initiation, promotion and progression. Professor Campbell's analogy in his book, *The China Study* (2016), is spot on so I'll steal it. He says that the cancer process is roughly like planting a lawn. Initiation is when you put the seeds in the soil, promotion is when the grass starts to grow and progression is when the grass gets completely out of control, invading the driveway, borders and pavement.

It is carcinogens (cancer-causing agents) that 'implant' the seeds in the soil in the first place and these include tobacco smoke and alcohol but are mostly the by-products of industrial processes. They mutate normal cells into cancer-prone cells by damaging their DNA.

A wholefood vegan diet, brimming with fresh fruit and vegetables, wholegrains, pulses, nuts and seeds may significantly protect against the DNA damage by carcinogens – so diet is vital. For example, research shows (Riso *et al.*, 2010) that broccoli directly protects the lung cells of smokers (see Dr Michael Greger's short film at nutritionfacts.org/video/dna-protection-from-broccoli).

There are also studies showing that specific foods help prevent or repair DNA damage that can cause cancer – including apples, almonds, grapes, carob, Brussels sprouts, black pepper and soya (edamame, tofu and tempeh). (See nutritionfacts.org/topics/dna-damage.) So, certain plants in our diet can stop the initial cancer seeds being sown.

If a cell is damaged, however, and it passes that DNA damage to its daughter cells, the process is irreversible. Daughter cells and their progeny will forever be genetically changed, giving rise to a potential for cancer – but the key word here is 'potential'. The next process – promotion – is not inevitable. The grass seeds are ready to germinate but they need the right conditions in which to grow. They need water, nutrients, sunlight… otherwise they lie dormant. Cancer-prone cells also need certain conditions to multiply but promotion is reversible. This is really quite profound and depends upon whether early cancer growth is given the right conditions in which to prosper.

This is why diet is so important. There are dietary factors (known as promoters) which feed cancer growth and there are others (anti-promoters) which slow cancer growth (Campbell *et al.*, 2016).

Campbell's studies led him to believe that casein from cow's milk aggressively promotes cancer but, equally significantly, vegetable proteins do not, even at high levels.

Campbell widened his studies and found that nutrients were more important in the development of cancer than the dose of the initiating carcinogen which started the process.

Campbell and his colleagues were then given a rare opportunity to study the role of nutrition, lifestyle and disease on people's health in the most comprehensive manner ever undertaken in the history of medicine. They were onto *The China Study*.

VEGETABLES THAT MAY STOP CANCER GROWTH

A landmark study pitted 34 common vegetables against eight different types of human cancer cells (breast, adult brain tumours, kidney, lung, childhood brain tumours, pancreatic, prostate and stomach). The study measured cancer cell growth in a Petri dish under lab conditions and observed what happened if extracts from different vegetables were added (Boivin *et al.*, 2009). Certain veg cut cancer growth rates; some stopped cancer growth completely; others had a weak effect, including carrots, potatoes, tomatoes and lettuce.

The same team found that juice from berries inhibited the growth of five cancer cell lines (Boivin *et al.*, 2007). Blueberry, blackcurrant, raspberry, gooseberry and cranberry exhibited the strongest inhibition, whereas strawberry and blackberry had little or no inhibitory effect on the cancer cell lines tested.

One thing is clear, we need to eat a wide variety of fruit and vegetables as some will work against one type of cancer but not another. For example, radishes did nothing to slow pancreatic cancer but eliminated stomach cancer cell growth. Orange peppers had no impact on stomach cancer but cut prostate cancer cell growth by 75 per cent.

ALL ROUND CHAMPIONS AGAINST CANCER

The most powerful anti-cancer food of all: **Garlic**

Other winners were the cruciferous vegetables, including:

- Broccoli
- Brussels sprouts
- Kale
- Cabbage
- Curly cabbage
- Cauliflower
- Green (immature) onions*
- Leeks

All of these inhibited or stopped the proliferation of all tested cancer cell lines.

* Green onions are often mixed up with spring onions. Green onions are sold in bunches and have long, green leaves and slight bulbs. Spring onions look very similar but have a bigger white bulb. Brown onions (the ones we mostly use) are also powerful but not against all the cancers tested. The solution is: eat onions – all types!

THE CHINA STUDY

The China Study is a monumental look at 6,500 adults across 65 counties of China. It analysed the blood, urine, diet and food intake of these people. China was chosen because 87 per cent of the population is from the same ethnic group, the Han people, and were from rural and semi-rural China where they had lived and eaten food from the same area most of their lives. This massively limited the chance of differences in disease susceptibility being due to genetics and concentrated on the impact of diet and lifestyle on disease.

Nutrient levels varied considerably from county to county and two distinct groups of diseases emerged: diseases of affluence and diseases of poverty. There were marked patterns between each group. For example, a region that had high rates of breast cancer also had high rates of heart disease but not pneumonia.

In rural China, affluent people tended to suffer from certain cancers, along with diabetes and heart disease. People with low nutrition bore other diseases such as pneumonia, peptic ulcers and parasitic diseases but not cancer or heart disease. You might conclude that's because poor people die young, before they develop 'Western' diseases but not so, say the scientists in *The China Study*. All results were 'age-standardised' (age was taken into

account) so the result was clear – people with a lower intake of nutrients were getting less, or no, 'Western' diseases.

The next important question was, which nutrients, when eaten in higher levels, were causing 'Western' diseases?

WHICH NUTRIENTS CAUSE DISEASE?

In a nutshell, *The China Study* clearly demonstrated that animal protein and animal fat cause diseases of affluence – including many cancers, heart disease and diabetes; whilst plant nutrients such as fibre, antioxidants, vegetable protein and complex carbohydrates protect us from disease.

EAT MORE BUT WEIGH LESS!

A fascinating fact emerges from this study – although the average calorie intake of the least active Chinese person was 30 per cent HIGHER than the average American, body weight is one-fifth lower!

The China Study shows that eating diets high in animal protein and animal fat makes us more likely to store calories as body fat whereas diets low in animal protein and fat make us more likely to burn calories as heat rather than storing them as body fat (Campbell *et al.*, 2016).

Furthermore, the highly respected EPIC*-PANACEA study shows that even when meat-eaters and vegans eat the same number of calories, meat-eaters gain more weight (Vergnaud *et al.*, 2010).

They also found that people who eat lots of protein, at the expense of carbohydrate (containing fibre), gain more weight too (Vergnaud *et al.*, 2013). Both results paint the theory behind the Atkins diet in a dim light!

*EPIC is the European Prospective Investigation into Cancer and Nutrition.

THE VILLAINS

The biggest culprits in the British diet which contain the most animal protein and saturated (bad) fat and cause 'diseases of affluence' are:

- Cow's milk and milk products – especially cheese, cream, butter
- Meat and meat products – including red and white meats, sausages, meat pies

THE HEROES

The China Study (along with many others) has repeatedly shown that we need a variety of whole plant foods in our diet. Foods that actively protect our health and fight disease are:

- Fruit
- Vegetables
- Mushrooms
- Pulses – peas, beans, lentils
- Nuts
- Seeds
- Wholegrains

(See page 91 for what you need to eat each day for good health!)

Dairy and cancer

The figures for cancer in the UK are astonishingly high. One in two of us (born after 1960) will be diagnosed with cancer during our lifetime (Ahmed *et al.*, 2015 and Cancer Research UK, 2019).

Diet is crucial in cancer, because:

1 A 'Western diet' can directly cause certain cancers.

A typical 'Western diet', rich in meat and dairy foods, promotes cancer. Just four types – lung, bowel, breast and prostate – account for almost half of all cancer deaths in the UK. The World Cancer Research Fund say that 30-50 per cent of cancers are attributable to environmental and lifestyle factors, including a poor diet (WCRF/AICR, 2018). For some cancers – breast, bowel and prostate – the harmful effects of a poor diet may be considerably higher (Willett, 2000).

2 But no matter what the initial cause of cancer, our diet can help turn the damaged cells on or off.

The China Study clearly illustrates this. Liver cancer rates are very high in rural China, the primary culprit being the hepatitis B virus (HBV). But not everyone infected with the virus develops cancer and Professor Campbell gives diet as the main reason. People on high animal protein and animal fat diets, which triggered high cholesterol levels, had highly significantly increased levels of liver cancer (Campbell *et al*., 2016). This accords with decades of work showing how animal protein is a friend of cancer progression.

The nutritional effects on the cancers I've mentioned are virtually the same for all other cancers.

Breast cancer is the most common cancer in the UK. One in seven women will develop it at some point in their lives. In the UK, in 2017, more than 55,000 women were diagnosed with breast cancer and rates have doubled since the early 1970s (Office for National Statistics, 2015; WCRF, 2020).

Breast cancer rates, however, vary widely between countries, with richer nations suffering more than poorer ones. Compared to Northern Europeans, Jamaican and Puerto Rican women are almost half as likely to get breast cancer, whereas in rural China, women are six times less likely to develop it.

Breast cancer: the milk link

A wealth of evidence showing how diet impacts on breast cancer is accumulating. Common themes occur in the scientific literature; a diet rich in dairy and meat is linked to an increased risk of breast cancer while whole plant food, vegan diets are linked to a lower risk.

A major review of studies on diet and breast cancer published in the journal *Anticancer Research* found that diets high in saturated fats (dairy, red and processed meat and eggs), added sugars, fried foods and refined grains increase the risk of breast cancer whilst diets based on fruit and vegetables, pulses (peas, beans and lentils), wholegrains, nuts and seeds lower the risk by up to 46 per cent (Dandamudi *et al.*, 2018).

The landmark study described on page 24 found that vegetables

linked with stopping or slowing breast cancer cell growth in a Petri dish include (most powerful first) garlic, leeks, green onions, Brussels sprouts, cauliflower, cabbage, broccoli, radish, kale, brown onions, green beans, red cabbage, asparagus, spinach, beetroot, potatoes, jalapeno peppers, radicchio, cucumber and orange peppers (Boivin, 2009).

In a study of over 50,000 women, drinking more than a cup of cow's milk daily had 22 to 84 per cent higher risk of breast cancer, while the average risk increase from drinking just two thirds of a cup daily was a massive 50 per cent (Fraser *et al*., 2020). The scientists studied women who drank cow's and soya milk and based on their data, they estimated that drinking soya milk instead of dairy milk could, on average, slash the risk of breast cancer by 32 per cent.

Another study looked at how cow's milk stimulates certain reactions in the body that encourage the growth of breast cancer (Melnik, 2021). The author highlighted that cow's milk contains many hormones and bioactive molecules that can trigger these dangerous reactions and cause harm in the human body. Two thirds of UK milk is taken from pregnant cows with the remainder coming from cows that have recently given birth – when hormone levels are sky-high. Additionally, drinking cow's milk raises levels of the growth hormone IGF-1 in humans and higher levels are linked to cancers of the colon, prostate and breast (Shanmugalingam *et al.*, 2016).

The sad truth is that most women are not aware of the strong evidence showing that milk and dairy products in our diet can affect our risk of developing breast cancer. Nor are they aware that only five to 10 per cent of all breast cancers are linked to an inherited breast

A Fighting Chance by VIVA! Health

An easy-to-read, online, colourful guide that summarises the impact of diet on breast cancer. It provides vital information on which foods can help fight cancer. Includes a seven-day meal plan.
viva.org.uk/materials/a-fighting-chance

Oestrogen levels are a critical determinant of breast cancer risk and directly participate in the cancer process (Campbell *et al*., 2016). Oestrogens are found in meat and eggs but major sources are cow's milk and dairy products, which account for 60 to 70 per cent of the oestrogens consumed (Malekinejad and Rezabakhsh, 2015).

cancer gene. It follows that the vast majority of cancers (90-95 per cent) are not caused by abnormal genes. Nearly a third of all breast cancer cases are attributed to avoidable risk factors – alcohol, high meat and dairy consumption and lack of exercise – and a low intake of whole plant foods.

A word on soya – a review of studies showed it has a clear protective effect against breast cancer and may lower the risk (Boutas *et al*., 2022). And another review highlighted how soya can be helpful for breast cancer patients and may improve treatment outcomes (Rizzo *et al*., 2018).

PROSTATE CANCER: THE ROLE OF DAIRY

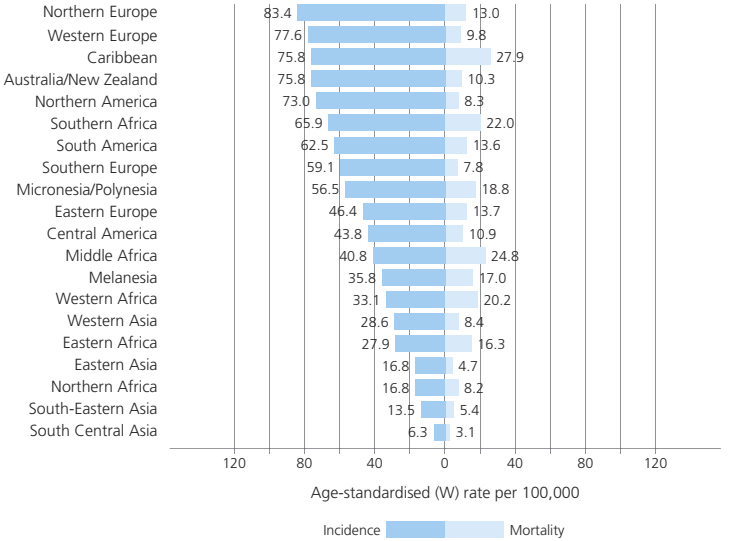
The prostate is a male reproductive gland about the size of a walnut which sits below the bladder. It produces some of the fluid that helps sperm on its mission to fertilise a woman's egg.

For such a little thing, it certainly causes a lot of problems. Prostate cancer is the second most common cause of cancer death in UK men, after lung cancer (Cancer Research UK, 2022). About one in eight men will develop it at some point in their lives, with over a third of them being 75 and over.

There are many different factors that influence the development of prostate cancer and experts think that only five to 10 per cent are linked to inherited genes (Macmillan Cancer Support, 2018). This means that 90 per cent plus of prostate cancers are caused by environmental and/or lifestyle factors. Research suggests that obesity, animal-based diets and a lack of exercise may be linked to prostate cancer. A diet high in red meat, saturated animal fats and dairy may increase your risk (Mandair *et al*., 2014).

As with breast cancer, the highest rates of prostate cancer occur in the developed world, the lowest rates being in Africa and Asia.

Age standardised (World) incidence and mortality rates, prostate



Source: Sung *et al*., 2021.

A global look at the problem confirms that there are clear links with diet, with increasing rates following the worldwide spread towards a Westernised diet, characterised by high intakes of calories, animal fat and meat and a low intake of fibre (Gathirua-Mwangi *et al*., 2014).

Dairy products are also strongly linked to prostate cancer and this was first discovered in the 1980s (Snowdon, 1988). Since then, other studies have identified the components of milk which are probably responsible and these include oestrogen, the growth hormone IGF-1, calcium from milk and dairy protein (Melnik *et al*., 2022).

For example, an important European Prospective Investigation into Cancer and Nutrition (EPIC) study found that each 35 grams of dairy consumed daily was associated with increasing the risk of prostate cancer by one third (Allen *et al*., 2008). Other studies found that whole milk greatly raises the risk of deadly prostate cancer and also increases the risk of the disease returning (Lu *et al*., 2016; Tat *et al*., 2018).

IGF-1 concentration is significantly associated with an increased risk of prostate cancer. The higher the IGF-1 levels, the higher the risk of prostate cancer, particularly the lethal type (Watts *et al.*, 2021). Our bodies increase their production of IGF-1 when we eat meat and dairy. Scientists suggest that higher levels of IGF-1 in middle to late adulthood are strongly associated with prostate cancer risk later in life (Price *et al.*, 2012).

In a recent study looking at cow's milk consumption throughout life, dairy was shown to be a major dietary risk factor for the development of prostate cancer. It showed how bioactive molecules in cow's milk initiate a signalling pathway and that this, along with constant exposure to cow's milk oestrogens, may explain the link between high dairy consumption and increased risk of prostate cancer in Westernised societies (Melnik *et al.*, 2021).

Researchers at Loma Linda University in California found a 35 per cent lower risk of prostate cancer in men who followed a vegan diet (Tantamango-Bartley *et al.*, 2016). Vegan diets exclude all animal products (including meat, fish, dairy and eggs) and tend to include more fruit, vegetables, nuts, wholegrains and pulses.

Increasing your intake of tomatoes (including tomato paste, tinned and cooked tomatoes), cruciferous vegetables (broccoli, kale, rocket, cabbage), soya, pomegranates, beans, lentils, peas, raisins, dates and other dried fruit (Mills *et al.*, 1989, Mandair *et al.*, 2014) significantly reduces the risk of prostate cancer. Vegetables linked with stopping or slowing prostate cancer cell growth in a Petri dish include (most powerful first) garlic, Brussels sprouts, green onions, leek, broccoli, cauliflower, kale, brown onions, cabbage, beetroot, jalapeno, red cabbage, celery, orange peppers, spinach, cucumber, radicchio, asparagus, fennel bulb, radish, aubergine, potatoes, tomatoes and bok choy (Boivin, 2009).

A review of 25 studies on the effect of diet on prostate cancer in real-life cases (rather than in a Petri dish) found that a vegan diet may slow prostate cancer growth and improve survival rates (Berkow *et al.*, 2007). They found that disease progression was faster in men who ate lots of saturated fat and slower in those eating lycopene-containing tomatoes and flaxseed.

BOWEL CANCER: GETTING TO THE BOTTOM OF IT

Bowel cancer is the fourth most common cancer in the UK and the second most common cause of cancer death – accounting for 10 per cent of all cancer deaths (Cancer Research UK, 2022a). Every 12 minutes someone in the UK is diagnosed with it and every 32 minutes, someone dies from it.

As with breast and prostate cancers, the rates of bowel cancer vary wildly across the world. For example, rates are high in the UK and USA but almost non-existent in Bangladesh. Migrant studies have shown that as people move from a low-cancer risk area to a high risk area, they develop the same risk of getting bowel cancer as their host country within two generations. In other words, in most cases this is not an inherited 'genetic' disease. It is now well established that causes include obesity, alcohol, smoking and poor diet.

BEWARE MEAT AND DAIRY

Even the NHS, which is not particularly progressive regarding dietary advice, says: "A large body of evidence suggests a diet high in red and processed meat can increase your risk of developing bowel cancer" (NHS, 2022).

In November 2007, The World Cancer Research Fund launched the report *Food, Nutrition, Physical Activity, and the Prevention of Cancer: a Global Perspective*. It was the most comprehensive report to date published on the link between cancer and lifestyle (WCRF/AICR, 2007). The report warned that eating 150 grams of processed meat a day (the equivalent of two sausages and three rashers of bacon) increases bowel cancer risk by 63 per cent and that 50 g/day (one sausage) increases the risk by about 20 per cent. The WCRF's more recent report, published in 2018, strengthens previous warnings about meat (WCRF/AICR, 2018). Their current cancer prevention recommendation is to eat no more than moderate amounts of red meat, such as beef, pork and lamb, and eat little, if any, processed meat. They say there is strong evidence that consumption of either red or processed meat causes bowel cancer.

Red and processed meats may cause bowel cancer because the type of iron they contain – haem iron, mainly from the animal's blood – can cause changes in cells that lead to cancer (Bastide *et al.*, 2011). Other nasties found in red and processed meats are N-nitroso compounds, heterocyclic amines and polycyclic aromatic hydrocarbons, which may directly cause mutations in cells in the large bowel, leading to cancer (WCRF/AICR, 2018a). The iron found in plant foods is non-haem iron, which does not have the same detrimental effects as haem iron.

As with breast and prostate cancers, there are mounting concerns that consuming cow's milk and dairy products raises levels of the growth hormone, IGF-1 in our blood – and we know that higher IGF-1 levels may increase the risk of bowel cancer too (Knuppel *et al*., 2020). In fact, Professor Campbell states: "insulin-like growth factor-1 is turning out to be a predictor of cancer just as cholesterol is a predictor for heart disease" (Campbell *et al*., 2016).

In a healthy person, IGF-1 efficiently manages the birth and removal of cells. However, under unhealthy conditions, IGF-1 more vigorously increases the birth and growth of new cells while stopping the removal of old cells, both of which favour the development of cancer (Campbell *et al*, 2016).

OBESITY: AN EXPANDING EPIDEMIC

Western-style diets based on meat, dairy, eggs and sugary and processed foods go hand-in-hand with the obesity epidemic. When it comes to dairy specifically, a Dutch study found that skimmed and semi-skimmed cow's milk, non-fermented dairy products, buttermilk; flavoured yoghurt drinks, cheese and cheese snacks were all linked to excess weight (Brouwer-Brolsma *et al*., 2018).

Compared with meat-eaters, fish-eaters (pescatarians) and even vegetarians, vegans tend to have the healthiest weight (body mass index) across studies and populations (Le and Sabaté, 2014; Najjar and Feresin, 2019).

Vegans who consume a wholefood diet tend to stabilise at their natural, healthy weight.

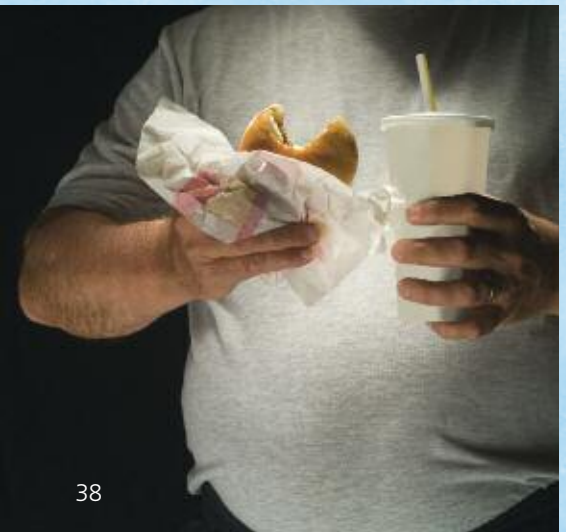
On the other hand, meat and dairy products contribute to obesity.

And the evidence that being obese increases the risk of bowel cancer is stronger now than ever before (Mathers, 2019). Obesity also increases IGF-1 levels which is why it is a risk factor for cancer.

Scientists believe that after not smoking, maintaining a healthy weight is the most important thing you can do for cancer prevention.

A vegan diet helps you slim without calorie counting!

See the *V Plan Diet* by Viva! Health at viva.org.uk/resources



PLANTS PROTECT

It has been known for decades that a wholegrain, vegan diet containing lots of fruit and vegetables (and therefore fibre) helps protect us from bowel cancer. Two large-scale studies published in *The Lancet* examined the relationship between diet and bowel cancer and both confirmed that as dietary fibre intake increases, the risk of bowel cancer decreases.

The first study concluded that dietary fibre, particularly from grains such as wholemeal bread, wholewheat pasta, porridge and other oat cereals, muesli, brown rice and fruits, was associated with a decreased risk of bowel cancer (Peters *et al.*, 2003). In the second study – and this one was gigantic – researchers from the European Prospective Investigation into Cancer and Nutrition (EPIC) looked at the association between dietary fibre intake and the incidence of bowel cancer in 519,978 individuals aged between 25 and 70 years-old, recruited from 10 different European countries (Bingham *et al.*, 2003).

The evidence that processed meat (smoked meat, ham, bacon, sausages, pâté and tinned meat) is a cause of bowel cancer is so strong that the World Cancer Research Fund recommends people should avoid eating it altogether. They also state that to help avoid cancer generally: "Eat mostly foods of plant origin."

Source: wcrf.org/dietandcancer/recommendations/limit-red-processed-meat

Again, people with the highest fibre intake (35 g/day) had a 40 per cent lower risk of colorectal cancer compared to those with the lowest intake (15 g/day).

EPIC continues to study bowel cancer and the latest findings amongst over half a million participants (Bradbury *et al.*, 2014) confirms that dietary fibre protects us against bowel cancer.

In countries with low intakes of dietary fibre, a doubling of fibre intake from foods such as wholegrains, fruit and vegetables could reduce the risk of bowel cancer by a whopping 40 per cent

Including more fibre in a meaty diet is not the answer. A study comparing the diets of African Americans and Native Africans found that their fibre intake was the same, but African Americans ate more protein, fat, meat, saturated fat and cholesterol, suggesting the higher bowel cancer rates in African Americans are linked to their higher intake of animal foods (O'Keefe *et al.*, 2007).

In the UK, most people do not eat enough fibre – the average daily intake is 18 g/day while the NHS recommends a minimum of 30 g/day. The well-respected Washington-based group, Physicians Committee for Responsible Medicine, recommend 40 g/day.

You don't need to measure the amount of fibre you're getting, just follow the chart on page 91, eat a variety of wholefoods and you won't go wrong.

There are many other chronic diseases linked to dairy consumption and here are a few to illustrate how our diet can affect how we feel. (For the full shooting match, read the excellent *White Lies* report at viva.org.uk/materials/white-lies).

ACNE AND MILK – SPOT ON!

American actor, activist and playwright Woody Harrelson says: "I was about 24 years old and I had tons of acne and mucus. I met some random girl on a bus who told me to quit dairy and all those symptoms would go away in three days". He followed her advice, found she was right and has never looked back!

Guess what? The growth hormone, IGF-1 found in milk and milk products and linked to cancer, is also a culprit in causing acne. At least two-thirds of cow's milk in the UK is taken from pregnant cows, at a time when the hormone content increases substantially (see page 17).

Increased insulin needed to digest milk products, together with IGF-1, makes your skin cells more sensitive to androgens. These are steroid hormones present in dairy products and which encourage more and faster production of oil (sebum) and skin cells. The result is oily skin and clogged pores where bacteria can breed.

It's interesting that bodybuilders who use steroid hormones are more prone to acne as are athletes who use whey-based supplements

in shakes and the like. Dairy affects hormone levels and therefore the skin. Case studies show that some young athletes lost their acne when taken off whey supplements but it returned when they went back to using them (Silverburg, 2012).

Two large studies looked at nine to 15-year-old children, including more than 6,000 girls (Adebamowo *et al.*, 2006) and more than 4,000 boys (Adebamowo *et al.*, 2008). For girls, there was a strong link between acne severity and all types of dairy products – severe acne was 20 per cent more likely if they consumed two or more servings of milk per day compared to girls who consumed less than one serving per week.

For boys, the association was significant for all their milk intake but also for skimmed milk alone. They were 16 per cent more likely to have severe acne on two or more servings of milk per day compared to boys who consumed less than one serving per week.

A recent study investigating the relationship between milk, dairy products and acne in young people found that having a glass of milk daily increased the likelihood of acne by 41 per cent (Juhl *et al.*, 2018).

Research on adult acne and diet revealed that the worst offenders for acne-prone skin are fatty and sugary foods, cow's milk and sweet drinks (Penso *et al.*, 2020).

The research is very clear – dairy is the main offender where acne is concerned, closely followed by sugary and processed food. A vegan diet high in fruit and vegetables, wholegrains, pulses, nuts and seeds, on the other hand, is best for your skin. Oh, and research shows that vegan chocolate (non-dairy) is *not* linked to acne!

Diabetes – Dairy's Toll

Sadly, diabetes is spiralling out of control. There are 4.9 million diabetics in the UK (Diabetes UK, 2022) with 700 people with diabetes dying prematurely each week. The global rise is astonishing. In 1980, 108 million people worldwide had diabetes but by 2014 this figure leapt to 422 million people! (World Health Organisation, 2017.) Diabetes occurs more in cultures consuming diets high in animal fat. As plant intake increases and saturated animal fat intake decreases from country to country, the number of deaths from type 2 diabetes plummets from 20.4 to 2.9 people per 100,000 (Campbell *et al.*, 2016).

Diabetes is a chronic disease caused by too much sugar (glucose) in the blood. Blood sugar levels rise when there is not enough insulin in the blood, or the insulin does not work properly. Insulin is a vital hormone secreted by the pancreas and it regulates blood sugar levels by encouraging our cells to take glucose out of our blood to make energy.

When things go wrong, high levels of glucose in the blood can cause damage to the nerves and blood vessels. Without treatment,

diabetes can lead to long-term health problems, including kidney failure, gangrene, sensory loss, ulceration, blindness, cardiovascular disease and stroke.

Type 1 (insulin-dependent) diabetes occurs when the body produces little or no insulin. It is an autoimmune disease where the body attacks its own insulin-producing cells in the pancreas and requires daily administration of insulin.

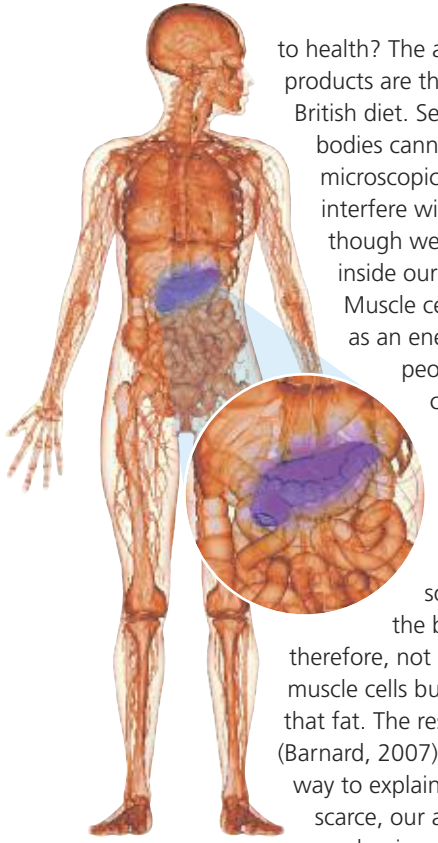
Type 2 diabetes occurs either when the body cannot use the insulin it produces or it does not produce enough. Ninety per cent of UK cases of diabetes are type 2 (Diabetes UK, 2022) and these are largely the result of unhealthy diets high in saturated animal fat and cholesterol, physical inactivity and excess body weight, especially around the middle (tummy).

Meat and Dairy Damage in Diabetes

Meat and dairy are a major cause of diabetes. A long-term study followed the eating habits of people for 17 years. It showed that eating just one serving of meat per week significantly increases the risk of diabetes. People following a low-meat diet had a 74 per cent increase in the risk of type 2 diabetes compared to vegetarians (Vang *et al.*, 2008). Some of this difference was due to obesity and/or weight gain in the meat-eating group but even after allowing for this, meat itself remained an important cause of the disease.

Another study following more than 200,000 people for more than 20 years revealed that people whose diets were almost entirely vegan and based on healthy foods had as much as 50 per cent lower risk of developing diabetes compared to the rest of the population (Satija *et al.*, 2016).

The big question is, why? What makes animal products so damaging to health? The answer is simple – fat! Meat and dairy products are the major source of saturated fats in the British diet. Several studies reveal that when our bodies cannot cope with all the fats we're eating, microscopic drops of it accumulate in our cells and interfere with their ability to react to insulin. Even though we might produce enough insulin, the fat inside our cells blocks the necessary reactions. Muscle cells normally store small amounts of fat as an energy reserve but, in insulin-resistant people, fat can build up to levels 80 per cent higher than in healthy people. Slim people are not necessarily exempt as it takes years for diabetes and other symptoms to develop.



It doesn't end here. An abundance of fat in the bloodstream also turns off some of those genes that normally help the body to burn fat! A high-fat diet, therefore, not only causes fat accumulation in the muscle cells but also slows down its ability to burn that fat. The result is an inability to respond to insulin (Barnard, 2007). Our evolutionary history may go some way to explaining this paradox. When food was scarce, our ancestors developed special mechanisms to store fat in their bodies when they had the opportunity – it was vital for their survival. We live in a very different world now but our bodies are still ready to store fat at any time if we provide it for them. And boy, do we provide it for them!

The common diet in many countries, including the UK, is high in fat, animal products and sugary foods and low in plant wholefoods such as fruit and vegetables, pulses and wholegrains. Not only is this responsible for ever-increasing numbers of overweight or obese people but it also increases the risk of diabetes and cardiovascular disease.

Low-fat vegan diets reverse type 2 diabetes

It is well-established that switching to a vegan diet can yield remarkable results in reversing type 2 diabetes.

In one of the first groundbreaking studies, 197 men with type 2 diabetes switched to a low-fat, vegan diet and after just three weeks, 140 of them were able to discontinue their medication! (Barnard *et al.*, 1994.)

Several studies followed, each of them testing the effects of a vegan, low-fat diet that emphasises foods with a low glycaemic index (they release sugars slowly) and all of them came to the same conclusion – that this type of diet is more effective than any other diet and even some medication (McMacken *et al.*, 2017).

This is great news as it means we can all take steps to prevent or reverse type 2 diabetes. Viva! Health has developed the innovative D-Diet which does just that by detailing what a wholefood vegan diet should consist of.

Reverse, or protect yourself from diabetes with Viva!'s online, groundbreaking, easy-to-read guide *The Big D – Defeating Diabetes with the D-Diet*. Includes a seven-day meal plan, recipes and practical shopping tips. Find the guide and our fully referenced diabetes report at viva.org.uk/diabetes

Basic principles of Viva!'s D-Diet

1st principle: no to all animal products

By rejecting all animal products, such as meat, fish, dairy and eggs, you will avoid eating substantial amounts of fat and your cholesterol intake will, literally, be zero. Even lean white meat and fish contain surprising amounts of fat. For example, 38 per cent of calories from roast chicken and 40 per cent of calories from salmon come from fat. But dairy is really loaded – 75 per cent of calories from Cheshire or Cheddar cheese come from fat.

See Viva!'s guide for a GI chart, *The Big D – Defeating Diabetes with the D-Diet* (see p46)

2nd principle: low fat

Even though vegetable oils are better than animal fats as they contain essential fatty acids, less saturated fat and no cholesterol, it is still important to keep them to a minimum.

Cutting down fat intake is vital for many reasons – to help muscle cells reduce the amount of fat interfering with insulin sensitivity, to improve heart health, to reduce the risk of many degenerative diseases and to promote weight loss.

3rd principle: low GI

Glycaemic index (GI) is a measure of the effects of carbohydrates (sugars and starches) on blood sugar levels. Carbohydrates that break down quickly during digestion and rapidly release glucose have a high GI; those that break down more slowly, have a low GI. It is these latter types of food that are the ones you need.

The D-Diet – a low-fat wholesome vegan diet – is what we should all be eating for greater energy and better health. It not only helps the body to reduce fat stored in its cells, which causes insulin resistance, but also brings about improved blood sugar control, reduces blood cholesterol, helps to induce weight loss without portion restriction, prevents further kidney and nerve damage and helps to lower blood pressure.

The usefulness of a vegan diet was endorsed by the American Diabetes Association in 2010.

Type 1 Diabetes and Dairy

With type 1 diabetes, our body's immune system's 'soldiers' (T-cells), attack our own pancreatic cells which produce insulin. Tragically, this is an incurable and serious disease and most often strikes children under 14 years of age.

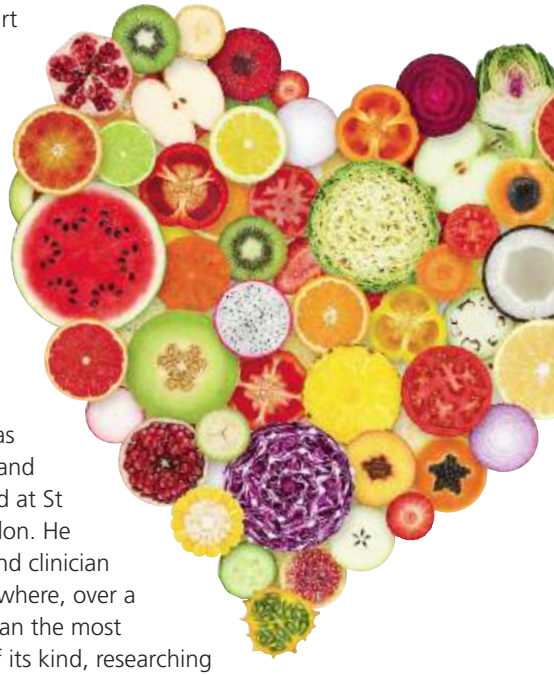
Early exposure to cow's milk proteins and insulin – in individuals who are genetically susceptible to the disease – has been strongly linked to type 1 diabetes (Paronen *et al.*, 2000; Kimpimaki *et al.*, 2001; Thorsdottir *et al.*, 2003; Chia *et al.*, 2017).

When these children drink cow's milk, it may trigger an autoimmune reaction which accidentally destroys the insulin-producing cells in the pancreas. That means the immune system launches an attack against the milk proteins but in doing so it also destroys the pancreas cells. Recently, it's been suggested that it's not just milk proteins that the body attacks but also the bacteria in cow's milk – the MAP (*Mycobacterium avium subspecies paratuberculosis*) that causes Johne's disease in cattle and is present in pasteurised milk (Niegowska *et al.*, 2016; Songini *et al.*, 2017). The immune system starts attacking these foreign molecules but because the insulin-producing cells share a similarity with them, they are destroyed too.

It doesn't happen in everyone but if the child has genes making them more susceptible to this reaction, there's a risk of type 1 diabetes developing as a result.

Heart Disease: Mending a Broken Heart

Every three minutes, someone dies from a heart attack or stroke in the UK (British Heart Foundation, 2022). Heart disease is our biggest killer, with one in four men and one in six women dying from it. Yet heart expert Dr Caldwell B Esselstyn told me: "Heart disease need not exist and if it does, it need not progress. I have an ambitious goal: to annihilate heart disease – to abolish it once and for all. Your arteries at the age of 90 ought to work as efficiently as they did when you were nine."



Dr Esselstyn should know! He was trained as a surgeon at the Cleveland Clinic, USA, and worked at St George's Hospital, London. He was also a researcher and clinician at the Cleveland Clinic where, over a period of 20 years, he ran the most comprehensive study of its kind, researching the impact of nutrition on people with advanced heart disease. Despite the usual, aggressive treatment his patients had received – including bypasses and angioplasties – some had been told they had less than a year to live.

The patients ranged in age from 43 to 67 and represented a spectrum of the community – factory and office workers, teachers and company executives. Don Felton (54) is typical of those in the study. His wife, Mackie, used to fry bacon for him every morning and

then make gravy from the grease. "I loved it," Don says, "I ate it for years."

Don arrived at Dr Esselstyn's office having been told by his cardiologist that after years of chronic heart trouble and treatment, including a failing double bypass, there was nothing more conventional medicine could do for him. Dr Esselstyn recalls Don walking with a limp as he was in acute pain as a result of the main artery in his leg being fully blocked. Don agreed to go on Dr Esselstyn's programme.

Dr Esselstyn's Diet To Reverse Heart Disease

The rules in their simplest form are:

- You may not eat anything with a mother or face (no meat, poultry, fish)
- No dairy products
- No oil of any kind – not a drop
- No nuts or avocados

You can eat a wonderful variety of delicious, nutrient dense foods:

- All vegetables (except avocados)
- All pulses – beans, peas, lentils of all kinds
- All wholegrains and products, such as bread and pasta made from them, so long as no added fats
- All fruits

Dr Esselstyn's patients' initial responses varied from an enthusiastic, "This is my last hope – I'll start now," to, "You must be joking!" However, the proof of the no-fat pudding is in the eating. After three months, Don's chest pain eased and he no longer had to sleep propped up with pillows to ease his angina. After seven months he could walk without stopping and without pain. A test showed that blood flow in the leg artery that had been blocked was back to normal.

And what of Esselstyn's other patients? The group began the study with an average blood cholesterol of 246 mg/dL (6.4 mmol/L) – too high. By changing their diet and using cholesterol-lowering drugs, they reduced their group average to 137 mg/dL (3.5 mmol/L). This is the most profound drop in cholesterol levels in any such study (Esselstyn, 2007).

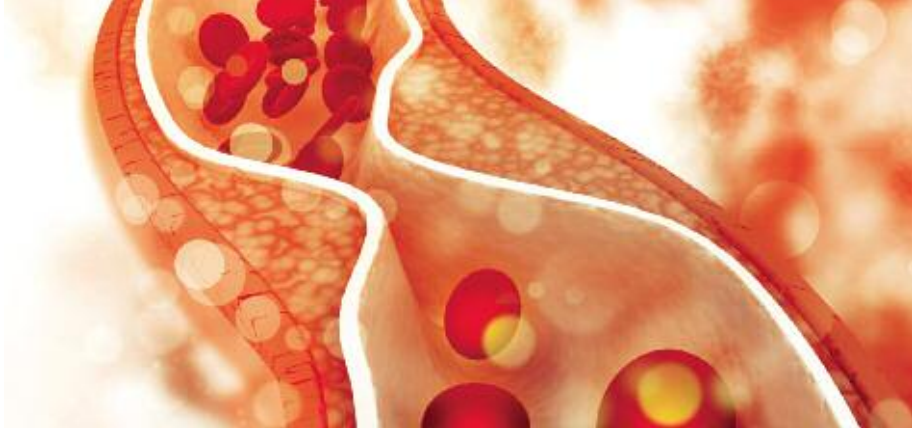
In all the patients who had angiograms (an X-ray of the coronary arteries) progression of the disease had stopped and in most cases, it had been reversed. Again, the results are stunning and scientific proof of the healing power of food. We can eat ourselves into a state of disease or eat ourselves out of it!

The most far-reaching study on the effect of diet on health, as I've mentioned, is *The China Study* (see page 25). It found that cardiovascular disease is nearly non-existent in areas where cholesterol levels are consistently below 150 mg/dL (3.9 mmol/L) (Campbell *et al.*, 2016). In the UK, it is recommended that people reduce their cholesterol levels to below 5.0 mmol/L, however, again the level to avoid heart attacks entirely is 3.9 mmol/L.

Another brilliant man is Dr Dean Ornish, Clinical Professor of Medicine at the University of California

and best known for his Lifestyle Heart Trial. He investigated the role of a low-fat, high-fibre diet – along with lifestyle changes – in 28 heart disease patients. They followed a low-fat, plant-based diet, including unrestricted amounts of fruits, vegetables and grains. They also practised stress management techniques and exercised regularly. After one year, 82 per cent of the test group experienced regression of their heart disease, including a 91 per cent reduction in the frequency of heart pain compared to 165 per cent increase in the control group. This trial has continued with similar outcomes: no conventional drug or surgery-related therapies compare with these results (Campbell *et al*., 2016).

It is also well-established that plant-based diets lower the risk of high blood pressure by 40 to 60 per cent (Alexander *et al.*, 2017). An extensive review of the evidence published in the journal, *Nutrients*, explains how a plant-based diet high in fruits, vegetables, pulses and nuts lowers blood pressure by improving the health of blood vessels, protecting them from damage, reducing inflammation, improving blood sugar regulation and keeping cholesterol levels low (Lee *et al*., 2020).



CHOLESTEROL — WHY IS IT A HEARTBREAKER?

Just the size of your fist, your heart pumps oxygen-rich blood around your organs in blood vessels known as arteries and it returns to the heart through veins.

Your heart needs its own blood supply to keep pumping and heart disease occurs when arteries carrying blood for the heart to use (coronary arteries) start to become blocked. Gradually, they become furred with 'plaques' – a thick sludge formed from cholesterol and other substances. This process is known as atherosclerosis.

This furring up results in a narrower blood vessel through which blood has to flow. It can also block nutrients from being delivered to the artery walls, which can then lose their elasticity and result in high blood pressure, increasing the risk of heart disease. This same process can, of course, happen in arteries throughout the body.

With a restricted blood supply, your heart labours to keep beating, causing horrible chest pain from angina. When one of the coronary arteries becomes completely blocked, you are at a very high risk of a heart attack.

80 per cent of heart disease cases are influenced by our lifestyle – mainly unhealthy diets loaded with 'bad' (mainly meat and dairy) fats, smoking, little exercise and too much booze (Rippe, 2019).

The cholesterol in your blood comes from two sources: the food you eat and your liver. Your liver makes all the cholesterol you need, so it is not needed in your diet. There are two main types of cholesterol:

- High density lipoprotein (HDL) is known as 'good' cholesterol because it collects excess cholesterol and carries it from the arteries to the liver for breakdown
- Low density lipoprotein (LDL) is referred to as 'bad' cholesterol because if there is an excess in the bloodstream, it is deposited along artery walls. This is linked to higher risk for heart disease and stroke

Dietary cholesterol is only found in animal foods (meat, fish, shellfish, eggs, dairy and so on), there is **none** in **any** plant foods. Even fat-rich plants such as avocados, nuts and seeds do not contain any cholesterol.

Consuming cholesterol-rich foods can increase the body's levels of cholesterol to some extent but much more problematic is the effect of eating animal protein and saturated animal fats, mainly found in dairy products, such as hard cheeses, cream, ice cream, milk chocolate and butter; red and white meats, fish and eggs as well as coconut and palm oil. This is because eating too much animal protein, saturated (and hydrogenated) fats stop the liver from being able to remove 'bad' LDL cholesterol from the blood, causing cholesterol levels to rise. Vegetable protein tends to have the opposite effect and soya and oats, for example, can dramatically lower cholesterol levels.

One study compared the effect of eating either 50 grams of butter or vegetable oils daily for four weeks (Khaw *et al.*, 2018). In participants who ate butter, total and bad cholesterol levels shot up compared to the other group.

A review of 112 studies, published in the *Journal of the American Heart Association* found that replacing one to two servings of animal protein every day with plant protein (mainly soya, nuts and pulses) reduced cholesterol and could help lower the risk of heart disease and stroke (Li *et al.*, 2017).

As with the other diseases I refer to, heart disease is largely caused by our lifestyle. The World Health Organisation say bluntly 'civilisation kills!' – a massive 80 to 90 per cent of heart disease is influenced by our lifestyle (WHO, 2014). In particular: tobacco use, unhealthy diet, physical inactivity and the harmful use of alcohol.

OSTEOPOROSIS
DAIRY DAMNS 'DEM BONES

The myth about people needing calcium from cow's milk is so pervasive that you'd think vegans were boneless blobs, wobbling around the floor!

This is the *crème de la crème* (excuse the pun) of myths from the dairy industry: we, but especially our children, must have cow's milk for strong bones and teeth.

Western nations have been duped into believing that we need to suckle from cows to obtain calcium! When you think about it, the notion is preposterous. After all, how did we develop a healthy skeleton for most of our evolution when we did not drink dairy? And how, today, do the majority of the world's people have strong bones when they don't consume dairy?

The supreme irony is that the disease of weak bones, osteoporosis, is more common in the nations that consume the most dairy products!

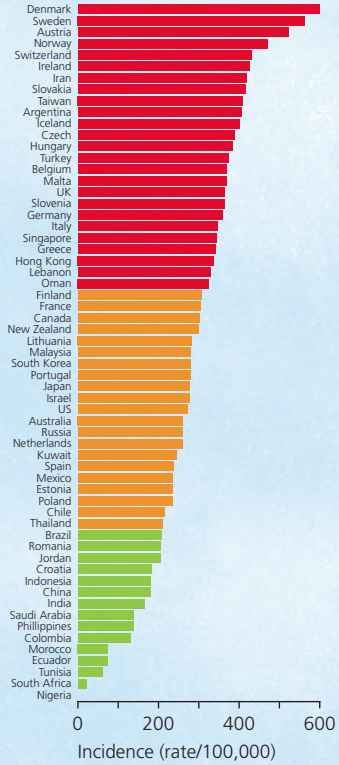
Figures from 63 countries show the truth of this, with a huge variation in fracture rates – some countries having 10 times as many fractures as others (Kanis *et al.*, 2012). The UK, where dairy consumption is high (average of 270 grams of dairy products a day), has one of the highest osteoporosis rates in the world. Nigeria, on the other hand, which eats a diet high in plantains, tubers, wholegrains, vegetables and pulses and where

only one per cent of the diet is dairy and less than three per cent is meat – has almost no cases of osteoporosis (National Bureau of Statistics, Nigeria, 2012).

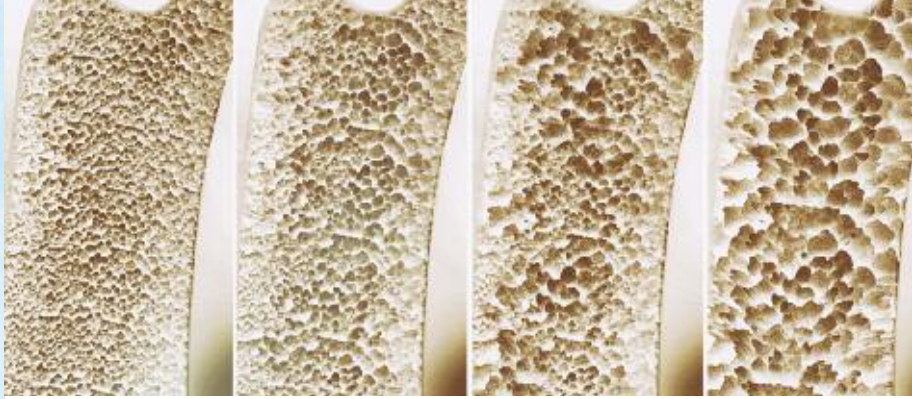
The results of a 22-year-long study of over 96,000 people confirmed that milk is truly no bone builder (Feskanich *et al.*, 2014). The researchers found that men consuming high amounts of milk during adolescence had a higher risk of hip fracture in adulthood. For women, they found no bone-beneficial effect of milk consumption whatsoever.

You may be wondering how Inuit people survive? According to scientists, one outstanding discovery was that after the age of 40, Inuits had high bone loss and fast progression of osteoporosis. This was attributed to a diet very high in animal protein and phosphorus and low in fresh fruit and vegetables (Mazess *et al.*, 1974).

Incidence (rate/100,000)
Age-standardised annual incidence of hip fractures in women (per 100,000) according to country together with the colour codes for risk (high, medium or low (red, orange or green, respectively).



Source: Kanis *et al.*, 2012.



Animal protein and bone loss

There is plenty of research showing that a diet high in animal protein may be undermining bone health. And conversely, that fresh fruit and vegetables protect and strengthen our bones.

A huge analysis of 34 surveys from 16 countries found that 70 per cent of all fractures were linked to eating animal protein (Abelow *et al.*, 1992). Another scientific team tested the same theory in a seven-year study of 1,035 women. They found that those with diets high in animal protein had almost four times more bone loss – and a 3.7 times higher risk of hip fracture – than women who ate the least amount of animal protein (Sellmeyer *et al.*, 2001). A newer study found that older women with higher intakes of animal protein had weaker bones than women who ate more plant protein (Isanejad *et al.*, 2017).

A highly-regarded study of more than 120,000 women, lasting 12 years, showed that eating more than 95 grams of animal protein a day significantly increased the risk of forearm fracture (Feskanich *et al.*, 1996).

And there's more! A gargantuan study of almost 80,000 women in the USA led by scientists at the Department of Nutrition at Harvard School of Public Health, examined whether by increasing your cow's milk intake you can reduce the risk of fractures. It found that not only does milk not protect bones from fractures but that women drinking two or more glasses of milk a day actually increased their risk of hip fracture (Feskanich *et al.*, 1997).

Another study looked at children and their bone growth and concluded that animal foods, particularly meat, had a negative effect on bone mass increase (Zhang *et al.*, 2010). The US National Osteoporosis Foundation's position statement (Weaver *et al.*, 2016) explains that protein intake is important for bone health together with adequate calcium but that protein sources that don't produce much acid are better for the body – that means plant proteins!

And an important review of 58 different scientific papers examining whether high calcium or high dairy intake improves bone health in children was published in the highly esteemed *Pediatrics* journal. It concluded neither option gives even a modest benefit (Lanou *et al.*, 2005). One of the authors of this review, Professor Amy Lanou, PhD, holds a doctorate in human nutrition from Cornell University and her book, *Building Bone Vitality* (Lanou and Castleman, 2009), makes clear that for healthy bones we must:

- Increase fruit and vegetable servings to six to 10 per day
- Avoid or limit protein from animal sources (no meat, dairy and so on)
- Exercise regularly (at least 30 minutes every day)
- Get adequate vitamin D through sunshine or a supplement
- Obtain calcium and other bone-healthy nutrients from plant sources

Everything we eat forms acids or alkalis when digested. Milk and dairy products (except for yoghurt) are acid-forming. The theory is that the body neutralises acids by drawing out calcium from the blood and muscles and if that's not enough, even from the bones. Over long periods of time, this can weaken the bones. Potassium salts (alkalis) in fruit and veg protect bones – they may neutralise the acids from dairy and other foods, like meat, sugar and alcohol (Lambert, 2015).

The ongoing European Prospective Investigation into Cancer and Nutrition (EPIC) studied almost 9,000, 35 to 67-year-old women (Weikert *et al.*, 2005) and showed that as animal protein intake increases, bone health deteriorates. Conversely, as vegetable protein increases, bones are found increasingly to be protected. This study accounted for age, weight, hormone replacement therapy, smoking, exercise, alcohol intake, menopausal status, education and occupation… in other words the scientists narrowed down the impact to the effects of protein alone.

When we consume dairy, calcium floods our body and much of it is quickly lost in our urine because so much of it can't be immediately used or stored. When we eat healthy plant foods, we are not overwhelmed with excessive calcium but instead we get a steady supply throughout the day. Our body then uses what it needs without depositing excess calcium in the wrong places, risking kidney stones and hardening of tissues – including blood vessels which can increase the risk of heart attack. Also, when small amounts of calcium are absorbed into our blood throughout the day from plant sources, hormone regulation is more precise so that bone breakdown and build up is not overstimulated.

It is vital that we eat enough calcium, as well as a host of other nutrients, for bone health, see page 95 for recommended amounts. However, osteoporosis is generally not a disease of low calcium. It is caused by many factors including bad diet (often with excess calcium and animal protein and low fruit and veg), smoking, alcohol consumption, low oestrogen or testosterone, lack of exercise and being underweight.

Despite relentless claims by the dairy industry, milk is neither the only nor the best source of calcium. It takes strength to stand up against a lifetime of propaganda – but that is what we have to do in order to sweep aside the myth that dairy is the holy grail for strong bones and teeth. In fact, the opposite is true. In terms of diet, the biggest favour you can do for 'dem bones is avoid dairy and all animal products and enjoy a wholefood vegan diet packed with fruit and vegetables, mushrooms, pulses, nuts and seeds and small amounts of vegetable oils.

The separation of dairy cows and their newborn calves is traumatic for both. Desperate cows can bellow for days in the hope of being reunited with their baby

Animal welfare

THE DARK SIDE OF DAIRY

There are around 1.67 million dairy cows living on the UK's 8,040 dairy farms (AHDB Dairy, 2021). Ninety per cent are the Holstein or Holstein-Friesian breed (black and white cows) while other breeds include Ayrshire, Guernsey and Jersey cows.

Cows produce milk to feed their babies – just like humans. It flows for the best part of a year and then stops. More milk requires more babies so around one million dairy calves are born in the UK each year – that's the reality of dairy farming. It sounds innocuous but masks a cruel, much darker side of the dairy industry that few people ever see.

DESPERATION

Despite the myth of contentment, a dairy cow is the hardest working mother of all. She nurtures a growing baby inside her for nine months while simultaneously being milked for seven of those months. Owing to selective breeding, the amount of milk she is forced to produce has more than doubled over the last four decades.

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). High yielding cows produce up to an astonishing 51 litres (90 pints) a day (Price, 2018).

To keep the flow going, a cow is forcibly impregnated every year by artificial insemination and her first pregnancy occurs between 14 and 28 months old, giving birth to her first calf nine months later.

SEPARATION

A cow would naturally suckle her calf for nine months to a year but calves born on dairy farms are wrenched from their mums just a day or two after birth, once they have suckled the colostrum – and all so we can drink the milk that was meant to nourish her calf. A strong mother-baby bond forms within the first few hours of birth, making their separation

traumatic and supremely callous (Marchant-Forde *et al.*, 2002). And it makes no difference whether the farm is organic or intensive.

Farmers allow the newborn baby to drink colostrum (their mother's first milk) for 24 to 48 hours as it is vital for the calf's immunity. It is high in antibodies that help the calf fight disease. 'Normal' milk production kicks in three to five days after giving birth.

The industry makes poor attempts to hoodwink us as to why they take babies from their mothers. They say:

- Precise amounts of colostrum can be given to the calf after the initial two days of being with mum (and that this benefits the calf)
- Separation reduces diseases in calves

and the biggest myth:

- Dairy cows aren't good mothers, as they lack the instincts to raise a calf

See page 73 for rescue stories that highlight the true nature of these gentle animals.

In reality, it's all about money. Isn't it always? Babies are taken from mothers so that we, as human society, can steal all their milk for our own consumption. It is also for 'ease of management of the dairy cow'. No calves get in their way at milking time and farmers find it easier housing cows without babies.

The cow will be made pregnant again two to three months after her calf has been taken and the process is repeated every year until she is killed. The magic of reproduction has been perverted with cows no longer seen as mothers producing food for their babies but mere milk machines.

EXHAUSTION

The crushing double burden of pregnancy and lactation for seven months out of every 12 inevitably takes its toll – excruciating mastitis (udder infection), lameness, infertility and low milk yield. A quarter of all UK cows are culled every year because of physical exhaustion and disease when most are only six years old (Cattle Health and Welfare Group, 2020). This is the age equivalent of killing a woman at about 20 years old.

Professor John Webster of Bristol University's Clinical Veterinary Science Department, compares this cruel and punishing physical burden to "a jogger who goes running for six to eight hours every day, which is a fairly lunatic pursuit".

HUNGER

The Holstein cow has been bred to overproduce milk, making up to 12 times more than her calf could ever drink. For much of the year, the food she eats has to:

- Nourish her own body
- Nourish her growing calf during pregnancy
- Produce enormous quantities of milk

It is almost impossible! The result is a distressed animal who simply cannot eat enough food at pasture to be healthy and is in a permanent state of metabolic hunger. Cows would naturally spend 12-14 hours a day lying down but the modern dairy cow faces the constant conflict of whether to allow herself the rest she needs or continue eating.

The high demands for calcium and magnesium during pregnancy and for her unnaturally high production of milk often results in illness. Milk fever is the most common cause of sudden death in dairy cows and happens when her low blood calcium cannot support her nerves and muscles. Grass staggers happen when her magnesium intake is low but her needs are high – she may become nervous and excitable and then stagger and fall. Many cows die from this completely preventable disorder.

Cows simply cannot meet the nutritional demands of simultaneous pregnancy and lactation and it is usual for them to 'milk off their backs' (draw on body reserves), resulting in a 'coat rack' appearance with ribs and spine protruding. In other words, the UK's dairy herd is generally suffering from malnutrition.

Lameness

Lameness causes "considerable pain and distress to the cow" (Farm Animal Welfare Council, 2009), and over 10 per cent of dairy cows are culled because of it (Cattle Health and Welfare Group, 2020). Watch any herd of dairy cows and you'll usually see some hobbling in agony. The average number of lame cows in a herd is almost one in three, although on some farms, it is as high as two thirds (Griffiths *et al.*, 2018). Many are simply left in pain to continue producing milk.

Most lameness cases are due to laminitis, sole ulcers or infections, such as digital dermatitis, while the rest are largely due to leg problems caused by injury during birthing or by badly designed cubicles in which they spend at least six months of their lives. These cubicles are often too small, forcing a cow to stand with her hind legs in the slurry passage and unable to lie down comfortably.

Laminitis

Laminitis is acute or chronic inflammation of soft foot tissue which "results in great pain to the animal" (Defra, 2005).

Laminitis is largely caused by a poor winter feed diet that is too high in protein and wet silage, both of which can form toxins in the cow. They travel in the bloodstream to the sensitive tissue of the growing hoof, which is well endowed with blood vessels, where they cause inflammation. Blood flow to the foot is then restricted, making the poor animal prone to ulcers and painful bacterial infections.

To understand the pain of laminitis, Professor Webster of Bristol University says: "…imagine crushing all your fingernails in the door and then standing on your fingertips." (Webster, 2005.)

Distortion

A cow's young would suckle eight to 12 times a day (Defra, 2015) but commercial milking often takes place only twice a day, meaning that up to 25 litres of milk can accumulate in her udder, which swells and can protrude between her hind legs. The outcome is leg distortion and an unnatural stance resulting in lameness.

Udder pain

Mastitis is an excruciatingly painful bacterial infection of the udder, affecting 26-36 cows out of 100 every year in the UK (Cattle Health and Welfare Group, 2020). Routine use of antibiotics has consistently failed to control it and milk for human consumption from infected cows can quite legally contain up to 400 million pus cells per litre.

Mastitis is the most common disease in dairy cows and a major reason why they are killed so young (Cattle Health and Welfare Group, 2020).

Mastitis symptoms can be obvious, such as swollen and hard udders and discoloured or clotted milk, but the main symptom – pain – is invisible to the eye.

Bacteria that cause mastitis thrive in dirty, wet bedding and can be transmitted from cow to cow simply through living together or via milking machines. As cows have been bred to produce too much milk, this unnatural strain weakens udder tissues, allowing bacteria to invade. Consistently unhealthy, her immune system is incapable of fighting disease as vigorously as it should.

Infertility

The arduous life that dairy cows endure causes such a rapid physical collapse that an alarmingly high number of young animals are killed due to infertility. A killing rate of 25 per cent pa is normal for most dairy herds and poor fertility is the single biggest cause (Cattle Health and Welfare Group, 2020; Dobson, 2008).

Although infertility in itself is not a welfare problem, it is an indicator of poor welfare resulting from physical exhaustion. The

Dairy cow at a farm supplying Arla, one of the world's biggest dairy producers. Her udders are oversized causing an unnatural stance, leading to painful sole ulcers. She is shackled to stop her doing the splits – probably due to nerve damage when she gave birth or slipping on the dirty, wet concrete floor

constant drive towards increased milk yields inevitably results in exhausted animals and decreased fertility.

To help combat the problem of infertility, fertility drugs are now in widespread use on British dairy farms.

Zero Grazing

Zero grazing is already the norm in some parts of the UK, as Viva!'s investigations of the UK dairy industry and 15 dairy farms that supply Cadbury show. See what we found at viva.org.uk/scarydairy

A report by the European Food Safety Authority states: "If dairy cows are not kept on pasture for parts of the year, ie they are permanently on a zero grazing system, there is an increased risk of lameness, hoof problems, teat tramp, mastitis, metritis, dystocia, ketosis, retained placenta and some bacterial infections" (EFSA, 2009).

Zero grazing is, in effect, a permanent extension of winter when all cows are kept indoors and never graze in fields. Usually kept in large herds, cows have rows of 'bedding' areas in the sheds and may or may not have access to outside yards.

Some intensive farms keep cows tethered in their stalls permanently, allowing them out only to go to the milking parlour. The poor animals are entirely deprived of their natural environment, which can lead to abnormal behavior, further stress, disease and aggression.

WHAT OF THE CALVES?

ISOLATION

Female calves follow in their mother's footsteps, replacing cows who have been killed. The first six to eight weeks of life are usually spent in small, isolated stalls or hutches, making exercise and socialising with other calves impossible. Despite the vast quantities produced, there is no mother's milk for them, just commercial milk-replacer.

At eight weeks' old they must be group housed and at a few months' old may be put outside to graze or transferred to a zero grazing unit. At just over a year old, artificial insemination begins, as does their gruelling life as a milk machine. Like their mums, they will die prematurely at about six years old and be used for low-grade meat products.

New-born calves are isolated in hutches for up to eight weeks

DESTRUCTION

Unlike their sisters, male calves can't produce milk and are similarly taken from their mothers at a day or two old. Many are pure dairy calves (dairy mother and father) while others are dairy/beef crosses. Viva! exposed the dairy industry's 'dirty secret': the shooting of day old male calves. Supermarkets cynically responded by changing the killing method. Instead of being shot, the calves are sent to slaughter. In 2020, about 60,000 calves were shot and 65,000 ended their sad short lives in abattoirs. Most were stunned with a captive bolt pistol and then their throat cut. These are the unwanted by-products of milk production and in the region of 130,000 are killed annually (Cattle Health and Welfare Group, 2020). Viva! filmed the shocking fate of male calves at farms supplying milk for the confectionary giant, Cadbury.

Pure dairy bull calves may also be sold to beef or veal farms but as they simply aren't 'beefy' enough, they are raised intensively, confined in buildings and yards for most of their six to 12-month-long lives, when they are killed for veal or low-grade beef. Around half of all the UK's beef comes from dairy herds (AHDB Beef and Lamb, 2017).

Male calf at Ramsgate after 10 hours on a lorry with still days to go before being cruelly reared for veal

The bull calves that are dairy/beef crosses are usually sold to beef farms and as young as seven-days-old may have to endure long journeys to and from livestock markets across the UK. Further, 'unwanted' male calves are shipped to the Continent for veal. For example, many unweaned babies travel appallingly long and arduous journeys from Scotland to Spain via Ramsgate docks.

END OF THE LINE

For all of her hard work and suffering, the dairy cow is sent to the slaughterhouse as soon as her milk yield drops. Worn out cows often endure a gruelling journey to market where they are sold to fattening (finishing) farms, before being sent to the abattoir, ending up in low quality beef products such as pies, burgers, soups and baby food.

Rescue stories

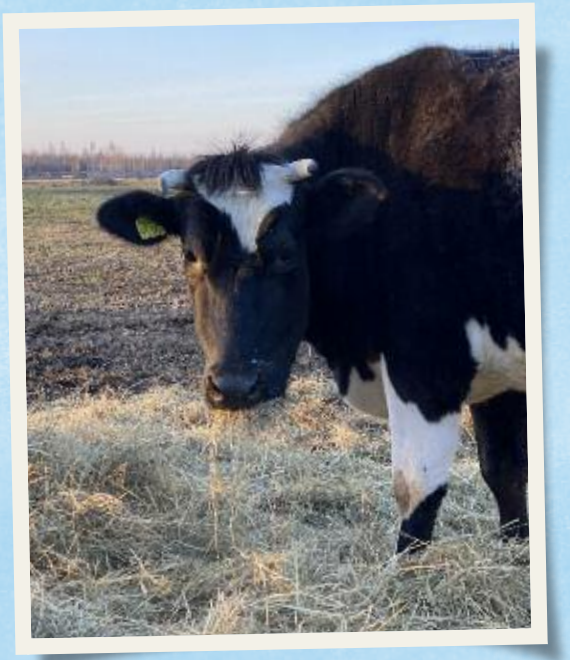
KRUFI – FREE TO ROAM AT LAST

Krufi had spent all her life in a cramped pen in a dark barn on a short chain before she was rescued.

She could never walk freely, feel or eat the grass; she could never decide for herself when she wanted to walk, play, find shade under a tree, or approach another cow. She could not decide the fate of any baby born to her.

Krufi was rescued from a dairy unit in Poland and she now has a forever home in Viva! Poland's beautiful 60 acre sanctuary near Warsaw. Krufi was sad, depressed and distrustful when she was saved. Now she lives free, never to be chained ever again, never to be forced to breed or have her calves stolen from her – in a herd where she has made very close friends.

Viva! Poland sanctuary's full name is "Schronisko w Korabiewicach Viva!"



Dean Farm Bachelor Herd

Dean Farm Trust is an animal sanctuary near Chepstow in Wales that provides a home for life to 180 rescued animals. Among the residents are 12 beautiful male cattle, all rescued from the veal industry at just a few weeks of age.

Buttercup and Clover were the first two calves to join the Dean Farm sanctuary family in 2019, when they were only five and six weeks old. They both appeared on the Channel 4 documentary "Meat the Family", where they lived with a family for three weeks and at the end of the programme, the family were given the option to send them to slaughter, or to save them and go vegetarian. Thankfully for Buttercup and Clover, the family showed compassion and chose to spare their lives. The other animals on the show sadly were not so lucky.

Later the same year, Dean Farm Trust had the opportunity to rescue 10 Friesian babies, also fated to be slaughtered for veal. These little boys were very small and vulnerable, aged between six and 11 weeks old – scared and missing their mums. Dean Farm Trust launched an appeal to help raise the funds to transport the calves to their new forever home and was overwhelmed when support and donations came in from all over the world. The charity's supporters also helped name the lucky boys whose lives had been spared – Phoenix Pipkin, Calvin Cariad, Kevin Finn, Malcolm Michief, Felix Smudge, Rusty Braveheart, Marty Patches, Benji Bubbles, Bobby Sprinkles and George Atlas.

Almost three years on since their rescue, Buttercup and Clover live in a beautiful big bachelor herd with their Friesian family. Loving, playful and each with their own personality and character, the happy herd are a big part of sanctuary life. The boys love to groom the other residents of the sanctuary, making a big fuss of their sheep, pony, donkey, pig and human friends. To learn more about Dean Farm Trust and their happy herd, please visit deanfarmtrust.org.uk

Scary Dairy

Viva!'s 2018 investigation of dairy farming in the UK in pictures

This poor soul was a wreck, she limped by me, her wasting body wracked with pain. Not some aberrant small farm – but owned by a supplier of Arla, the second biggest dairy group in the world

This cow had an eyeball protruding from its socket – a vet told us she would be in acute pain. Again owned by a supplier of Arla

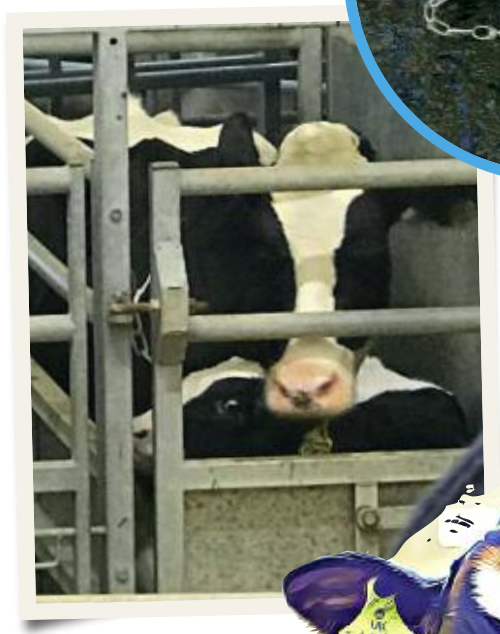
I witnessed the miracle of birth at Arla – knowing this baby would be taken from her mum within hours, never to see each other again

This cow was suffering so much, we called a vet who euthanised her. She provided milk for Aunty Moos ice cream

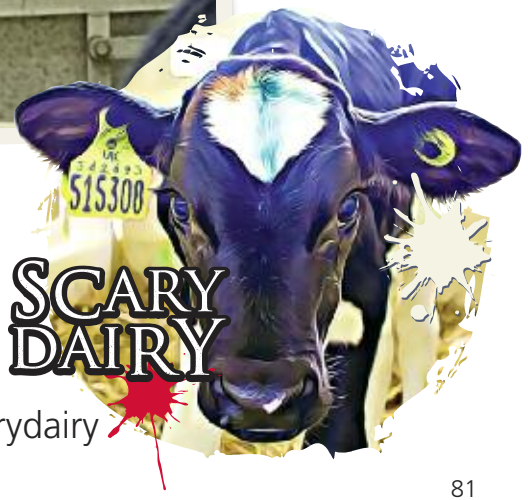
A Cadbury calf – alone and desperate, suckled my fingers for comfort. Her mum was metres away but they were parted forever so all her milk could be used for chocolate

These cows never see a blade of grass. They are zero-grazed which causes more lameness, depression and infections

Shackled to stop her doing the splits – probably due to nerve damage when she gave birth or slipping on the dirty, wet concrete floor



Mother and baby caged – about to be paraded at market – this is the last time they will be together



SCARY DAIRY

viva.org.uk/scarydairy

A Calf and a Half

A Viva! investigation of Cadbury dairy farms

Our undercover investigators went inside 15 dairy farms that supply Cadbury with milk and exposed the shocking reality of how milk for one of Britain's top confectionery brands is produced. We filmed the shocking fate of male Cadbury calves. Useless to the dairy industry, these 'by-products' are separated from their mothers at only hours old and disposed of. We witnessed a baby male calf being callously shot in the head. His body went to the local hunt for hound food. While this was the fate of numerous Cadbury calves, others are sold into the cruel veal, or beef industries or are slaughtered for pet food.

We filmed the trauma of birth and separation, including excruciating birth complications where a jack is used to wrench the calf out of his mother. We also documented the stressful separation of mother and calf and the subsequent desperate calling of both, one to the other. The separated calves were housed in small pens in very basic conditions.

We saw cows with distended udders producing 39 litres a day, zero grazed cows and those with debilitating illnesses – mastitis, lameness and milk fever.

THE SHOOTING OF A CALF

A beautiful little calf, just a few days old, bellows incessantly from a stone shed. He is as perfect as he could be – perfectly formed, perfectly healthy. He is distraught because he has just been separated from his mother and is bewildered and frightened.

"He won't be shouting much longer," says a boiler-suited farmer as a Land Rover growls up the track into the farm, towing a high-sided trailer. "Come on then," he says opening the gate and ushering the little creature towards the trailer. The teetering young calf doesn't quite know which way to go and needs urging – but his legs give up on him and he falls over.

The tailgate of the trailer is down, revealing a half-full mosaic of black and white, a pattern that quickly resolves itself into individual shapes – a large cow and several calves. All are dead. The driver picks up the calf and places him on top of the pile of corpses, climbing up after him, taking a revolver from his pocket as he does so.

He holds the calf's back while they both try to balance on the pliable bodies beneath their feet and then he levels the revolver at the animal's head: "For God's sake keep still," he says with irritation. BANG! And the tiny creature collapses in a heap, his life extinguished. The man climbs down, smiling at the farmer – he is from the local hunt.

A notice on the side of the trailer completes the story: "Not for human consumption," it says, "for feeding to hounds." Royal hounds, as it happens, as this load of dead dairy animals was destined for the Beaufort hunt, whose patrons are Prince Charles, his wife Camilla and Prince William.

Nanny State

Are you thinking about giving up cow's milk and replacing it with goat's? After all, goat's milk is promoted as the angelic answer to those who want a healthier, more humane alternative. The irony is that all the problems that exist in cow's milk production also exist in goat farming.

Mother and kid are separated almost immediately so her milk can be taken. Females are used to replenish the herd but males can't produce milk so they are either killed at birth or kept for meat for the growing ethnic market. Almost all kid goats suffer at least one painful mutilation (castration, dehorning), usually without anaesthetic.

Worried about zero grazing for cows? Well, it's already the norm for goats. Many herds run to over a thousand animals and these inquisitive, fun loving creatures are almost always housed in all-year-round intensive sheds.

A major Viva! investigation revealed the sickening life of goats on two of Britain's biggest dairy goat farms, one of which supplies the major distributor, Delamere Dairy. Upper Enson Farm, in Stafford, has some 1,800 animals and our investigator found it strewn with dead kids and a skip overflowing with corpses.

THE KIDS ARE NOT ALRIGHT

Another farm I visited near Taunton, Somerset, had about 1,200 animals. It was heart-breaking to film the beautiful, innocent reasons for the nanny goats' milk – their baby kids. The babies I filmed could barely stand, they were so young and so vulnerable – already robbed of their mums. As with all mammals, goats produce milk only because they give birth. Theirs is a five-month pregnancy. They are well known for being vigilant, loving and protective mothers but on all UK dairy goat farms, male and female babies are taken away almost immediately after birth.

We were informed that the male kids were, until recently, 'disposed of' by being swung by their legs to smash their heads against a metal post. When we filmed, however, a market had been found and they were being sold for meat to a Bristol-based company.

BILLY GOATS GRUFF

The male kids at Upper Enson Farm were also being sold for meat, which meant they had to suffer the pain of castration without anaesthetic. Viva! filmed two women casually lifting baby billy goats and placing a rubber ring around the base of their testicles so the blood supply was cut off and the testes would slowly shrivel and die. The government's Farm Animal Welfare Council (FAWC) describes this procedure as causing "pain and distress" and urges it be used as little as possible. At the very least, it pleads for pain relief to be given. It wasn't in this case.

We also filmed female kids being 'disbudded' by having their horn buds burnt out. A worker holds a baby animal over her lap, pushing the kid's neck into her leg as she forces the heated device down into the skull. The little creature struggles and cries. Kid after kid bleats and screams as each is subjected to this painful mutilation.

Goats are active, inquisitive, capricious, unpredictable, flighty, impulsive and whimsical. The word capricious comes from the Latin for goat (*capra*). It is shameful that these highly-intelligent, playful, endlessly curious animals are increasingly being factory farmed.

Delamere Dairy sells goat's milk products to almost every supermarket in the UK, including Sainsbury's, Tesco, Waitrose, Coop, Budgens, Asda, M&S and Whole Foods. Not only do they claim to have exceptionally high animal welfare standards but they also make some pretty grand health assertions!

Good For Health? Stop Kidding

"A large proportion of those with an intolerance to cow's milk are able to flourish on goat's milk…" Delamere Dairy boast on their website. Others claim that it is also perfect for people with cow's milk allergies. But what does the science say?

Goat's milk has virtually the same lactose (sugar) content as cow's milk, containing 4.4 grams of lactose per 100 grams of milk. Whole cow's milk contains 4.5 grams and semi-skimmed cow's milk, 4.7 grams. Patrizia Restani, from the Department of Pharmacological Sciences, State University Milan, reviewed the science on allergies and goat's milk and concluded that it is wholly unsuitable for the lactose intolerant (Restani, 2004).

Even more serious than lactose intolerance is milk allergy, caused by proteins and not sugars. Restani insists that statements claiming goat's milk is less allergenic than cow's milk are "controversial" and have "not been proved". And later reviews are in complete agreement – goat's milk is no less allergenic than cow's milk (Turck, 2013, Verduci *et al*., 2019).

Restani highlights a few studies demonstrating this – in one of them, 26 infants aged five months to seven years, who were allergic to cow's milk protein, were tested for goat's milk allergy. Twenty four out of 26 were allergic to both. In another study, 22 out of 28 children were allergic to both milks and just six to cow's milk alone.

Several independent studies have shown that milks from different animals all produce a similar immune reaction in people with cow's milk allergy.

Restani forcefully concludes that given the severity of the reaction to goat's milk in some people – which includes hives, eczema, difficulty in breathing and vomiting – goat's milk "must not be considered an appropriate replacement for infants or children with cow's milk allergy" and that "labels suggesting use of goat's milk for intolerant/hypersensitive people should be banned" (Restani, 2004).

Hormone Cocktail

Because of its link with cancer, the big question is: does goat's milk contain the growth hormone, IGF-1? And the answer is: yes and in similar amounts to cow's milk (Meyer *et al*., 2017). In fact, in early lactation, there's more IGF-1 in goat's milk than in cow's milk (Simonov *et al*., 2021).

Another hormone present in both cow's and goat's milk is oestrogen, though at a lesser concentration in goat's milk. Between 60 and 70 per cent of oestrogens in our diet come from animals' milk and although there are lower oestrogen levels in goat's than in cow's milk, they are certainly not negligible (Farlow *et al*., 2012).

Fat Kid

According to research in the *Journal of Dairy Science*, "The largest health concern for consumers of goat's milk is likely to be its greater fat content compared to cow's milk. More troubling is how much of the fat in goat's milk is saturated fat… if one is looking for a heart-healthy diet that includes dairy… goat's milk may not be the best alternative to cow's milk" (Farlow *et al*., 2012).

ARE YOU TAKING THE PUS?

Most revolting, though, is the 'somatic cell' or pus content of goat's milk! As stated earlier, cow's milk can legally contain up to 400 million pus cells per litre, so one teaspoonful of milk can have two million pus cells! According to several studies, goat's milk has on average 519-618 million of these cells per litre (Persson and Olofsson, 2011; Gecaj *et al.*, 2021). Milk really has got the lot!

With goats as with cows, it is the philosophy of factory farmed, mass production that triumphs; the same old cycle of pregnancy, removal of babies, constant milking, disease, deprivation and early death. And all for a product that may promote disease. Thank goodness for plants – soya, almonds, oat, hazelnuts, rice – and their milk of human kindness.

Everyone's Going Dairy-Free

WHAT I NEED TO EAT EACH DAY

NO. OF SERVINGS **5-8**

1

FOODS **Fruits**: Berries, apples, pears, peaches, oranges, kiwi fruit, bananas, raisins, mango etc.

Eaten whole or in smoothies (juices are more acidifying because they don't contain fibre and provide fruit sugar more readily than whole fruit).

And Vegetables: Broccoli, cauliflower, spinach, kale, leeks, carrots, peppers, tomatoes, squash, green beans, sweet potatoes, celery, lettuce, cabbage, Brussels sprouts etc.

HEALTHY PORTION SIZE

Fresh fruit: 1 medium piece (the size of a tennis ball)

Dried fruit: 1-1½ tablespoons or 1 golf ball

Green or root vegetables: 2-3 tablespoons or ½ tennis ball

Salad vegetables: 1 large cereal bowl or 80 g

TO PROVIDE

- Beta-carotene (makes vitamin A), Vitamins B2, B3, B5, B6, B9 (Folate), Vitamin C, Vitamin E, Vitamin K
- Minerals/trace elements such as Calcium, Iodine, Iron, Magnesium, Manganese, Phosphorus, Potassium
- Fibre

NO. OF SERVINGS 3-4

FOODS **Wholegrains** (eg Wholewheat Pasta, Wholewheat Bread, Brown Rice, Oats, Rye, Buckwheat etc)

HEALTHY PORTION SIZE

Cooked grains: 2-3 heaped tablespoons or ½ cup

Breakfast cereal: 25 g or 1 regular-sized cereal bowl

Muesli: 45 g or a small-sized bowl

Cooked wholewheat pasta: 1 cup as side dish or 2 cups as main dish

Wholewheat or rye bread: 2 slices

TO PROVIDE
- Vitamins such as B1, B2, B3, B5, B6
- Minerals/trace elements such as Calcium, Copper, Iron, Magnesium, Manganese, Phosphorus, Potassium, Zinc
- Fibre, Energy, Protein

NO. OF SERVINGS 3-4

FOODS **Pulses** (eg all types of Peas, Beans and Lentils), Nuts and Nut Butters or Seeds

HEALTHY PORTION SIZE

Peas, Beans and Lentils: ½ cup (cooked)

Nuts or Seeds: 2 tablespoons or a small handful

TO PROVIDE
- Vitamins such as B1, B2, B3, B5, B6, B9
- Minerals/trace elements such as Calcium, Copper, Iron, Magnesium, Manganese, Phosphorus, Potassium, Selenium, Zinc
- Protein, Energy, Fibre

NO. OF SERVINGS Small amounts

FOODS **Vegetable Oil** (eg Flaxseed, Hemp Seed, Virgin Olive Oil or Rapeseed Oil used cold; Sunflower or Soya Oil for cooking)
Vegetable Margarines

HEALTHY PORTION SIZE

½ tbsp flaxseed oil or 1½ tbsp of ground flaxseeds

TO PROVIDE
- Vitamins such as Vitamin E (Vegetable Oils), Vitamins A & D (Fortified Margarine)
- Energy
- Essential Omega-3 and Omega-6 Fats (Flaxseed, Soya, Walnut and Hemp Oils)

NO. OF SERVINGS At least 1

FOODS **B12 supplement**

B12 Fortified Foods, eg Fortified Soya Milk, Fortified Breakfast Cereal, Yeast Extract with B12, can contribute to your B12 intake but a supplement is a must – 50 micrograms daily or 2,000 weekly

TO PROVIDE
- Vitamin B12

NO. OF SERVINGS Small amounts

FOODS Vitamin D (made by sunlight on skin)

If you live in the UK take a vitamin D supplement from October to April (no matter what your diet!)

TO PROVIDE
- Vitamin D

At least 1.2 litres of fluid every day (six 200 ml or eight 150 ml glasses) should also be consumed as part of healthy, balanced diet. Water is the best choice. Tea and juices can be counted as water.

Chart by Juliet Gellatley BSc, Dip CNM , Viva!.

For a laminated wallchart go to vivashop.org.uk/goodhealthwallchart

Boning up on calcium

Why do we need calcium?

You guessed it – for bone health and strength! Around 99 per cent of our calcium is deposited in bones and teeth, the other one per cent is involved in the regulation of muscle contraction, heartbeat, blood clotting and functioning of the nervous system.

How much do we need? The UK reference nutrient intake (RNI) value for calcium is:

How much calcium you need each day

Your Age	How Much Calcium You Need Each Day
0-10 years	350-525 mg
11-18 years	800 mg girls, 1,000 mg boys
Adults	700 mg

Are you joining the millions of people in the UK who are dairy-free? A fantastic starting point is to sign up to the free 30 Day Vegan. Viva! will email you every day for 30 days with:

- Tasty, healthy breakfasts, lunches and dinners
- Celebrity vegan inspiration
- Nutritional advice
- Health information
- CAN'T COOK, WON'T COOK! version
- Or try just a week at viva.org.uk/V7

Try going dairy-free for a month now! Sign up for your free inspirational emails at viva.org.uk/V30

How much calcium is in these foods?

The following table shows how much calcium is present in a range of calcium-rich foods.

Food (and serving size)	Calcium (milligrams)
Cauldron Plain Tofu (100 g)	401
Alpro Soya Milk (200 ml glass)	240
Curly kale (1 cup – 117 g, boiled without salt)	177
Dried Figs (100 g – four to six pieces of fruit)	162
Kidney beans (1 cup, 177 g)	100
Wholemeal bread (2 slices)	100
Hummus (100 g)	89
Tahini (10 g – two teaspoonfuls spread on one piece of toast or stirred into a bowl of soup)	85
Almonds (30 g – a small handful)	76
Baked beans (small tin 200 g)	84
Chickpeas (1 cup, 150 g)	68
Chia seeds (1 tbsp)	63
Muesli (100 g)	55
Orange (medium)	52
Broccoli (1 cup, 97 g)	39
Walnuts (28 g – a small handful)	28
Cooked lentils (½ cup – 100 g)	19

My calcium-rich foods


ALMONDS


APRICOTS (DRIED)


ARTICHOKES


ASPARAGUS


BAKED BEANS (HARICOT)


BLACKBERRIES


BLACKCURRANTS


BLACKSTRAP MOLASSES


BOK CHOY


BRAZIL NUTS


BREAD (WHOLEMEAL)


BROCCOLI


CHICKPEAS


CINNAMON


EDAMAME (SOYA BEANS)

TOP TIP! Vitamin D is made by sunlight on the skin and is needed for calcium absorption. If you live in the UK, take a vitamin D supplement over winter.

HOW MUCH CALCIUM SHOULD I EAT A DAY?
700 MG


FENNEL


FIGS (DRIED)


KALE


KIDNEY BEANS


ORANGES


ROCKET


SESAME SEEDS
(EG IN TAHINI AND HUMMUS)
(AND OTHER SEEDS)


SOYA MILK (FORTIFIED)


SPRING GREENS


SWEDE


TOFU (CALCIUM-SET)


WALNUTS


WATERCRESS

For a laminated, A4 poster of this chart for your kitchen, visit viva.org.uk/materials/calcium-rich-foods-wallchart

WHAT IF WE DON'T GET ENOUGH?

When your diet does not provide enough calcium, it is taken from your bones in order to restore blood levels and maintain calcium-dependent bodily functions. If enough calcium is subsequently supplied, bone levels are restored but if your diet consistently fails to supply sufficient calcium, bone loss persists.

ARE PLANT MILKS GOOD SOURCES OF CALCIUM?

As you can see in this chart, yes, fortified soya (all types except organic), rice, oat and almond milks are all excellent sources of calcium. They are also much lower in 'bad' fats, have no cholesterol and many are fortified with the important vitamins D and B12.

COMPARING COW'S AND GOAT'S MILK WITH PLANT MILKS

Per 100ml	Whole cow's milk	Semi-skimmed milk	Goat's milk	Alpro soya milk	Alpro rice milk	Alpro almond milk
kcal	66	46	62	40	47	24
Calcium (mg)	118	120	100	120	120	120
Protein (g)	3.3	3.4	3.1	3.0	0.1	0.5
Fat (g)	3.9	1.7	3.7	1.8	1.0	0.1
Saturated fat (g)	2.5	1.1	2.4	0.3	0.1	0.1
Cholesterol (mg)	14	6	11	0	0	0
Vitamin D (mg)	Trace	Trace	0.1	(D2) 0.75	(D2) 0.75	(D2) 0.75
Vitamin B12 (ug)	0.9	0.06	0.1	0.38	0.38	0.38

IS THAT ALL? NO. DOSE UP ON VITAMIN D!

We need vitamin D to absorb calcium so if you have enough calcium but are low in vitamin D, you can be calcium deficient. Sunlight on our skin helps us make vitamin D but anyone who has little exposure to sunshine or always protects their skin from the sun should consider taking a daily 10 microgram vegan vitamin D supplement. It is now advised by the UK government that we apply sun block after 10 to 15 minutes exposure to the sun, to give us a chance of making vitamin D and in winter, if you live in the UK, everyone should take a vitamin D supplement.

Furthermore, magnesium, potassium, vitamin C and vitamin K are all required for good bone health so a healthy diet that includes eight to 10 servings a day of fruit and vegetables will sort you out.

If you live in the UK, take a vitamin D supplement during winter months (no matter what your diet!).

Conclusion: Milk – the wrong stuff

Drinking milk is cruel – it's also unnatural. Only humans drink it after weaning – and milk from a different species at that. It's no more natural than drinking badger's or cat's milk.

Designed for calves, many humans find milk hard to digest and the result is discomfort and pain. Hormones in milk are linked to cancers such as breast and prostate cancer as well as the teenage scourge, acne. Its proteins are linked to type 1 diabetes and allergies. The saturated fat, cholesterol and, again, animal protein it contains are linked to heart disease, Alzheimer's, type 2 diabetes and many other diseases.

Despite relentless claims by the dairy industry, cow's milk is neither the only nor the best source of calcium and even increases bone fracture rates.

Beans, lentils, broccoli, kale, watercress, nuts, seeds, soya and other plant foods are better and healthier sources.

Ditching dairy products has never been easier as supermarkets and health food shops now stock a wide selection of delicious and nutritious dairy-free alternatives to milk, yoghurt, ice cream, margarine and cheese!

References

Abelow BJ *et al*. 1992. Cross-cultural association between dietary animal protein and hip fracture: a hypothesis. *Calcified Tissue International*. 50 (1) 14-18.

Adebamowo CA *et al*. 2006. Milk consumption and acne in adolescent girls. *Dermatology Online Journal*. 12 (4) 1.

Adebamowo CA *et al*. 2008. Milk consumption and acne in teenaged boys. *Journal of American Academy of Dermatology*. 58 (5) 787-793.

Ahmad AS *et al*. 2015. Trends in the lifetime risk of developing cancer in Great Britain: comparison of risk for those born from 1930 to 1960. *British Journal of Cancer*. 112 (5) 943-947.

AHDB Dairy. 2021. UK milk yield [online]. Available from: https://ahdb.org.uk/dairy/uk-milk-yield [Accessed 10 March 2022]

AHDB. 2021. Dairy at a glance [online]. Available from: https://ahdb.org.uk/dairy/dairy-at-a-glance [Accessed 25 March 2022]

Alexander S *et al*. 2017. A plant-based diet and hypertension. *Journal of Geriatric Cardiology*. 14 (5) 327-330.

Allen NE *et al*. 2000. Hormones and diet: low insulin-like growth factor 1 but normal bioavailable androgens in vegan men. *British Journal of Cancer*. 83 (1) 95-97.

Allen NE *et al*. 2002. The associations of diet with serum insulin-like growth factor 1 and its main binding proteins in 292 women meat-eaters, vegetarians, and vegans. *Cancer Epidemiology and Biomarkers Prevention*. 11 (11) 1441-1448.

Allen NE *et al*. 2008. Animal foods, protein, calcium and prostate cancer risk: the European Prospective Investigation into Cancer and Nutrition. *British Journal of Cancer*. 98 (9) 1574-1581.

American Academy of Pediatrics. 2022. Why do infants need baby formula instead of cow's milk? Available from: https://www.healthychildren.org/English/ages-stages/baby/formula-feeding/Pages/Why-Formula-Instead-of-Cows-Milk.aspx [Accessed 1 July 2022]

American Diabetes Association. 2010. Standards of medical care in diabetes. *Diabetes Care*. 33 (Suppl. 1) S11-S61.

Barnard ND. 2007. *Dr. Neal Barnard's program for reversing diabetes: the scientifically proven system for reversing diabetes without drugs*. New York, NY, USA: Rodale Inc.

Barnard RJ *et al*. 1994. Diet and exercise in the treatment of NIDDM: The need for early emphasis. *Diabetes Care*. 17 (12) 1469-1472.

Bayless TM *et al*. 2017. Lactase non-persistence and lactose intolerance. *Current Gastroenterology Reports*. 19 (5) 23.

Berkow SE *et al*. 2005. Blood pressure regulation and vegetarian diets. *Nutrition Reviews*. 63 (1) 1-8.

Berkow SE *et al*. 2007. Diet and survival after prostate cancer diagnosis. *Nutrition Reviews*. 65 (9) 391-403.

Bingham SA *et al*. European Prospective Investigation into Cancer and Nutrition. 2003. Dietary fibre in food and protection against colorectal cancer in the European Prospective Investigation into Cancer and Nutrition (EPIC): an observational study. *The Lancet*. 361 (9368) 1496-1501.

Boivin D *et al*. 2007. Inhibition of cancer cell proliferation and suppression of TNF-induced activation of NFkappaB by edible berry juice. *Anticancer Research*. 27 (2) 937-948.

Boivin D *et al*. 2009. Antiproliferative and antioxidant activities of common vegetables: a comparative study. *Food Chemistry*. 112 (2) 374-380.

Bounous G *et al*. 1988. Evolutionary traits in human milk proteins. *Medical Hypotheses*. 27 (2) 133-140.

Boutas I *et al*. 2022. Soy isoflavones and breast cancer risk: a meta-analysis. *In Vivo*. 36 (2) 556-562.

Brouwer-Brolsma EM *et al*. 2018. Dairy shows different associations with abdominal and BMI-defined overweight: Cross-sectional analyses exploring a variety of dairy products. *Nutrition, Metabolism and Cardiovascular Diseases*. 28 (5): 451-460.

Burris J *et al*. 2013. Acne: The Role of Medical Nutrition Therapy. *Journal of the Academy of Nutrition and Dietetics*. 113 (3) 416-430.

British Heart Foundation. 2022. UK Factsheet [online]. Available from: https://www.bhf.org.uk/-/media/files/research/heart-statistics/bhf-cvd-statistics-uk-factsheet.pdf [Accessed 24 March 2022].

Bradbury KE *et al*. 2014. Fruit, vegetable, and fiber intake in relation to cancer risk: findings from the European Prospective Investigation into Cancer and Nutrition (EPIC). *American Journal of Clinical Nutrition*. 100 Suppl 1:394S-8S.

Campbell TC and Campbell TM II. 2016. *The China Study*: revised and expanded edition. Dallas, Texas, USA: BenBella Books.

Cancer Research UK. 2018. Bowel cancer risk factors [online]. Available from: www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-bycancer-type/bowel-cancer/risk-factors [Accessed 31 July 2022].

Cancer Research UK. 2019. Cancer risks statistics [online]. Available from: https://www.cancerresearchuk.org/health-professional/cancer-statistics/risk [Accessed 15 July 2022].

Cancer Research UK. 2022. Prostate cancer statistics [online]. Available from: www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/prostate-cancer [Accessed 14 March 2022].

Cancer Research UK. 2022a. Bowel cancer statistics [online]. Available from: https://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/bowel-cancer [Accessed 14 March 2022].

Cattle Health and Welfare Group. 2020. Fifth Report of the GB Cattle Health & Welfare Group [online]. Available from: ahdb.org.uk/knowledge-library/gb-cattle-health-welfare-group-fifth-report-2020 [Accessed 25 March 2022].

Chia JSJ *et al*. 2017. A1 beta-casein milk protein and other environmental pre-disposing factors for type 1 diabetes. *Nutrition and Diabetes*. 7 (5) e274.

Dandamudi A *et al*. 2018. Dietary patterns and breast cancer risk: a systematic review. *Anticancer Research*. 38 (6) 3209-3222.

Defra (Department for Environment, Food & Rural Affairs). 2005. *Lameness in beef cattle and dairy followers*.

Di Landro A *et al*. 2012. Family history, body mass index, selected dietary factors, menstrual history, and risk of moderate to severe acne in adolescents and young adults. *Journal of American Academy of Dermatology*. 67 (6) 1129-1135.

Diabetes UK. 2022. Diabetes statistics [online]. Available from: https://www.diabetes.org.uk/professionals/position-statements-reports/statistics [Accessed 22 March 2022].

Dobson H *et al*. 2008. Why is it getting more difficult to successfully artificially inseminate dairy cows? *Animal*. 2 (8) 1104–1111.

Esselstyn CB Jr. 2007. *Prevent and Reverse Heart Disease*. New York: Avery.

EFSA. 2009. Scientific opinion of the panel on Animal Health and Welfare on a request from European Commission on welfare of dairy cows. *The EFSA Journal*. 1143, 1-38.

Evershed RP *et al*. 2008. Earliest date for milk use in the Near East and southeastern Europe linked to cattle herding. *Nature*. 455 (7212) 528-531.

FAO. 1997. Latham, M.C. *Human nutrition in the developing world*. Rome: FAO Food and Nutrition Series No. 29. Cornell University Ithaca, New York, USA.

Farlow DW *et al*. 2012. Comparison of estrone and 17β-estradiol levels in commercial goat and cow milk. *Journal of Dairy Science*. 95 (4) 1699-1708.

Feskanich D *et al*. 1996. Protein consumption and bone fractures in women. *American Journal of Epidemiology*. 143 (5) 472-479.

Feskanich D *et al*. 1997. Milk, dietary calcium, and bone fractures in women: a 12-year prospective study. *American Journal of Public Health*. 87 (6) 992-997.

Feskanich D *et al*. 2014. Milk consumption during teenage years and risk of hip fractures in older adults. *JAMA Pediatrics*. 168 (1) 54-60.

Flatz G. 1987. *Genetics of lactose digestion in humans*. Chapter in Advances in Human Genetics, eds Harris, H; Springer Science+Business Media New York, 1-77.

Fraser GE *et al*. 2020. Dairy, soy, and risk of breast cancer: those confounded milks. *International Journal of Epidemiology*. 49 (5) 1526-1537.

Ganmaa D *et al*. 2012. Milk, dairy intake and risk of endometrial cancer: a 26-year follow-up. *International Journal of Cancer*. 130 (11) 2664-2671.

Gathirua-Mwangi WG *et al*. 2014. Dietary factors and risk for advanced prostate cancer. *European Journal of Cancer Prevention*. 23 (2) 96-109.

Gecaj RM *et al*. 2021. Somatic cell number, physicochemical, and microbiological parameters of raw milk of goats during the end of lactation as compared by breeds and number of lactations. *Frontiers in Veterinary Science*. 8: 694114.

Greer FR *et al*. 2006. American Academy of Pediatrics Committee on Nutrition. Optimizing bone health and calcium intakes of infants, children, and adolescents. *Pediatrics*. 117 (2) 578-585.

Grosvenor CE *et al*. 1993. Hormones and growth factors in milk. *Endocrine Reviews*. 14 (6) 710-28.

Griffiths BE *et al*. 2018. A cross-sectional study into the prevalence of dairy cattle lameness and associated herd-level risk factors in England and Wales. *Frontiers in Veterinary Science*. 5, 65.

Hartmann S *et al*. 1998. Natural occurrence of steroid hormones in food. *Food Chemistry*. 62 (1) 7-20.

Hoppe C *et al*. 2004. Animal protein intake, serum insulin-like growth factor I, and growth in healthy 2.5-y-old Danish children. *American Journal of Clinical Nutrition*. 80 (2) 447-452.

Howe R *et al*. 1990. Dietary factors and risk of breast cancer: combined analysis of 12 case-control studies. *Journal of the National Cancer Institute*. 82, 561–569.

Isanejad M *et al*. 2017. Association of protein intake with bone mineral density and bone mineral content among elderly women: The OSTPRE Fracture Prevention Study. *Journal of Nutrition, Health and Aging*. 21 (6) 622-630.

Juhl CR *et al*. 2018. Dairy intake and acne vulgaris: a systematic review and meta-analysis of 78,529 children, adolescents, and young adults. *Nutrients*. 10 (8) 1049.

Kahn HS *et al*. 1997. Stable behaviors associated with adults' 10-year change in body mass index and likelihood of gain at the waist. *American Journal of Public Health*. 87, 747-754.

Kanis JA *et al*. 2012. A systematic review of hip fracture incidence and probability of fracture worldwide. *Osteoporosis International*. 23 (9) 2239-2256.

Kimpimaki T *et al*. 2001. Short-term exclusive breastfeeding predisposes young children with increased genetic risk of Type I diabetes to progressive beta-cell autoimmunity. *Diabetologia*. 44 (1) 63-69.

Khaw KT *et al*. 2018. Randomised trial of coconut oil, olive oil or butter on blood lipids and other cardiovascular risk factors in healthy men and women. *BMJ Open*. 8 (3) e020167.

Knuppel A *et al*. 2020. Circulating insulin-like growth factor 1 concentrations and risk of 30 cancers: prospective analyses in UK biobank. *Cancer Research*. 80 (18) 4014-4021.

Lambert H *et al*. 2015. The effect of supplementation with alkaline potassium salts on bone metabolism: a meta-analysis. *Osteoporosis International*. 26 (4) 1311-1318.

Lanou AJ *et al*. 2005. Calcium, dairy products, and bone health in children and young adults: a re-evaluation of the evidence. *Pediatrics*. 115 (3) 736-743.

Lanou AJ *et al*. 2009. *Building bone vitality: a revolutionary diet plan to prevent bone loss and reverse osteoporosis*. The McGraw-Hill Companies, Inc., USA.

Le LT, *et al*. 2014. Beyond meatless, the health effects of vegan diets: findings from the Adventist cohorts. *Nutrients*. 6 (6) 2131-2147.

Lee KW *et al*. 2020. Effects of vegetarian diets on blood pressure lowering: a systematic review with meta-analysis and trial sequential analysis. *Nutrients*. 12 (6) 1604.

Li SS *et al*. 2017. Effect of plant protein on blood lipids: a systematic review and meta-analysis of randomized controlled trials. *Journal of the American Heart Association*. 6 (12).

Lomer MC *et al*. 2008. Review article: lactose intolerance in clinical practice myths and realities. *Alimentary Pharmacology and Therapeutics*. 27 (2) 193-103.

Lu W *et al*. 2016. Dairy products intake and cancer mortality risk: a meta-analysis of 11 population-based cohort studies. *Nutrition Journal*. 15 (1) 91.

Macmillan Cancer Support. 2018. Causes and risk factors of prostate cancer [online]. Available from: https://www.macmillan.org.uk/cancer-information-and-support/prostate-cancer/causes-and-risk-factors-of-prostate-cancer [Accessed 14 March 2022].

Malekinejad H *et al*. 2015. Hormones in dairy foods and their impact on public health – a narrative review article. *Iranian Journal of Public Health*. 44 (6) 742-58.

Mandair D *et al*. 2014. Prostate cancer and the influence of dietary factors and supplements: a systematic review. *Nutrition and Metabolism (Lond)*. 11, 30.

Marchant-Forde JN *et al*. 2002. Responses of dairy cows and calves to each other's vocalisations after early separation. *Applied Animal Behaviour Science*. 78, 19-28.

Mathers JC. 2019. Obesity and bowel cancer: from molecular mechanisms to interventions. *Nutrition Research*. 70, 26-31.

Mazess RB *et al*. 1974. Bone mineral content of North Alaskan Eskimos. *American Journal of Clinical Nutrition*. 27 (9) 916-925.

McMacken M *et al*. 2017. A plant-based diet for the prevention and treatment of type 2 diabetes. *Journal of Geriatric Cardiology*. 14 (5) 342–354.

Melnik BC. 2012. Excessive leucine-mTORC1-signalling of cow milk-based infant formula: the missing link to understand early childhood obesity. *Journal of Obesity*. 2012:197653.

Melnik BC, Schmitz G. 2017. Milk's role as an epigenetic regulator in health and disease. *Diseases*. 5 (1) 12.

Melnik BC. 2021. Lifetime impact of cow's milk on overactivation of mTORC1: from fetal to childhood overgrowth, acne, diabetes, cancers, and neurodegeneration. *Biomolecules*. 11 (3) 404.

Melnik BC, John SM, Weiskirchen R *et al*. 2022. The endocrine and epigenetic impact of persistent cow milk consumption on prostate carcinogenesis. *Journal of Translational Genetics and Genomics*. 6, 1-45.

Meyer Z *et al*. 2017. Analysis of the IGF-system in milk from farm animals – Occurrence, regulation, and biomarker potential. *Growth Hormone & IGF Research*. (35) 1-7.

Mills PK *et al*. 1989. Cohort study of diet, lifestyle, and prostate cancer in Adventist men. *Cancer*. 64 (3) 598-604.

Najjar RS *et al*. 2019. Plant-based diets in the reduction of body fat: physiological effects and biochemical insights. *Nutrients*. 11 (11) 2712.

NHS. 2021. Bowel cancer – causes [online]. Available from: www.nhs.uk/conditions/bowel-cancer/causes [Accessed 15 March 2022].

Niegowska M *et al*. 2016. Type 1 Diabetes at-risk children highly recognize *Mycobacterium avium* subspecies *paratuberculosis* epitopes homologous to human Znt8 and Proinsulin. *Scientific Reports*. 6: 22266.

Paronen J *et al*. 2000. Effect of cow's milk exposure and maternal type 1 diabetes on cellular and humoral immunization to dietary insulin in infants at genetic risk for type 1 diabetes. Finnish Trial to Reduce IDDM in the Genetically at Risk Study Group. *Diabetes*. 49, 1657-65.

O'Keefe SJ *et al*. 2007. Why do African Americans get more colon cancer than Native Africans? *Journal of Nutrition*. 137 (1 Suppl) 175S-182S.

Penso L al. 2020. Association between adult acne and dietary behaviors: findings from the NutriNet-Santé prospective cohort study. *JAMA Dermatology*. 156 (8) 854-862.

Persson Y *et al*. 2011. Direct and indirect measurement of somatic cell count as indicator of intramammary infection in dairy goats. *Acta Veterinaria Scandinavica*. 53 (1) 15.

Price R. 2018. How UK herd achieved world top 10 ranking for milk yield. Farmers Weekly [online]. Available from: www.fwi.co.uk/livestock/uk-herd-achieved-world-top-10-ranking-for-milk-yield [Accessed 15 March 2022].

Restani P. 2004. Goat milk allergenicity. *Journal of Pediatric Gastroenterology and Nutrition*. 39, 323-324.

Rippe JM. 2019. Lifestyle Strategies for Risk Factor Reduction, Prevention, and Treatment of Cardiovascular Disease. *American Journal of Lifestyle Medicine*. 13 (2) 204-212.

Riso P *et al*. 2010. DNA damage and repair activity after broccoli intake in young healthy smokers. *Mutagenesis*. 25 (6) 595-602.

Rizzo G *et al*. 2018. Soy, Soy Foods and Their Role in Vegetarian Diets. *Nutrients*. 10 (1) 43.

Romo Ventura E *et al*. 2020. Association of dietary intake of milk and dairy products with blood concentrations of insulin-like growth factor 1 (IGF-1) in Bavarian adults. *European Journal of Nutrition*. 59 (4) 1413-1420.

Salque M *et al*. 2013. Earliest evidence for cheese making in the sixth millennium BC in northern Europe. *Nature*. 493 (7433) 522-525.

Satija A *et al*. 2016. Plant-based dietary patterns and incidence of type 2 diabetes in US men and women: results from three prospective cohort studies. *PLoS Medicine*. 13 (6) e1002039.

Sellmeyer DE. 2001. A high ratio of dietary animal to vegetable protein increases the rate of bone loss and the risk of fracture in postmenopausal women. Study of Osteoporotic Fractures Research Group. *American Journal of Clinical Nutrition*. 73 (1) 118-122.

Shanmugalingam T *et al*. 2016. Is there a role for IGF-1 in the development of second primary cancers? *Cancer Medicine*. 5 (11) 3353-3367.

Silverberg NB. 2012. Whey protein precipitating moderate to severe acne flares in 5 teenaged athletes. *Cutis*. 90 (2) 70-72.

Simonov *et al*. 2021. Levels of insulin-like growth factor in bovine, goat, and sheep milk in different lactation periods: The etiological factor of cancer in humans. *International Journal of One Health*. 7 (2) 246-250.

Snowdon DA. 1988. Animal product consumption and mortality because of all causes combined, coronary heart disease, stroke, diabetes, and cancer in Seventh-day Adventists. *American Journal of Clinical Nutrition*. 48 (3) 739-748.

Songini M *et al*. 2017. Type 1 diabetes in Sardinia: facts and hypotheses in the context of worldwide epidemiological data. *Acta Diabetologica*. 54 (1) 9-17.

Spencer EA *et al*. 2003. Diet and body mass index in 38,000 EPIC-Oxford meat-eaters, vegetarians, and vegans. *International Journal of Obesity*. 27, 728-734.

Sung H *et al*. 2021. Global cancer statistics 2020: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA Cancer Jounal for Clinicians*. 71 (3) 209-249.

Tantamango-Bartley Y *et al*. 2016. Are strict vegetarians protected against prostate cancer? *American Journal of Clinical Nutrition*. 103 (1) 153-160.

Tat D, Kenfield SA, Cowan JE *et al*. 2018. Milk and other dairy foods in relation to prostate cancer recurrence: Data from the cancer of the prostate strategic urologic research endeavor (CaPSURE™). *Prostate*. 78 (1) 32-39.

Thorsdottir I *et al*. 2003. Dietary intake of 10- to 16-year-old children and adolescents in central and northern Europe and association with the incidence of type 1 diabetes. *Annals of Nutrition and Metabolism*. 47 (6) 267-275.

Turck D. 2013. Cow's milk and goat's milk. *World Review of Nutrition and Dietetics*. 108 56-62.

Uberoi E. 2021. UK dairy industry statistics. The House of Commons Library [online]. Available from: https://researchbriefings.files.parliament.uk/documents/SN02721/SN02721.pdf [Accessed 11 March November 2022]

Vang A *et al*. 2008. Meats, processed meats, obesity, weight gain and occurrence of diabetes among adults: findings from Adventist Health Studies. *Annals of Nutrition and Metabolism*. 52 (2) 96-104.

Verduci E *et al*. 2019. Cow's milk substitutes for children: nutritional aspects of milk from different mammalian species, special formula and plant-based beverages. *Nutrients*. 11 (8) 1739.

Vergnaud AC *et al*. 2010. Meat consumption and prospective weight change in participants of the EPIC-PANACEA study. *American Journal of Clinical Nutrition*. 92 (2) 398-409.

Vergnaud AC *et al*. 2013. Macronutrient composition of the diet and prospective weight change in participants of the EPIC PANACEA study. *PLoS One*. 8 (3) e57300.

Watts EL *et al*. 2021. Circulating insulin-like growth factor 1, total and free testosterone concentrations and prostate cancer risk in 200 000 men in UK Biobank. *International Journal of Cancer*. 148 (9) 2274-2288.

Weaver CM *et al*. 2016. The National Osteoporosis Foundation's position statement on peak bone mass development and lifestyle factors: a systematic review and implementation recommendations. *Osteoporosis International*. 27 (4) 1281-1386.

Webster J. 2005. *Animal Welfare: Limping Towards Eden*. Blackwell Publishing Ltd.

Weikert C *et al*. 2005. The relation between dietary protein, calcium and bone health in women: results from the EPIC-Potsdam cohort. *Annals of Nutrition and Metabolism*. 49 (5) 312-318.

Westman EC *et al*. 2002. Effect of 6-month adherence to a very low carbohydrate diet program. *American Journal of Medicine*. 113 (1) 30-36.

WCRF/AICR. 2018. Diet, nutrition, physical activity and cancer: a global perspective [online]. Available from: www.wcrf.org/diet-and-cancer/ [Accessed 11 March 2022].

WCRF. 2020. UK cancer statistics [online]. Available from: https://www.wcrf-uk.org/preventing-cancer/uk-cancer-statistics/ [Accessed 11 March 2022].

Wu A *et al*. 1999. Meta-analysis: dietary fat intake, serum estrogen levels, and the risk of breast cancer. *Journal of the National Cancer Institute*. 91 (6) 529-534.

Willett WC. 2000. Diet and cancer. *Oncologist*. 5 (5) 393-404.

Zhang Q *et al*. 2010. The association between dietary protein intake and bone mass accretion in pubertal girls with low calcium intakes. *British Journal of Nutrition*. 103 (5) 714-723.

Sources for table: How low can you go? (On page 16.)

Examples of percentage of protein in mammalian milk – human milk has the lowest amount.

Milk Composition – Species Table, Milk Composition & Synthesis Resource Library, Department of Animal Sciences, University of Illinois: http://ansci.illinois.edu/static/ansc438/Milkcompsynth/milkcomp_table.html

*Skibiel AL *et al*. 2013. The evolution of the nutrient composition of mammalian milks. *Journal of Animal Ecology*. 82 (6) 1254-1264 (see supporting information online: http://onlinelibrary.wiley.com/doi/10.1111/1365-2656.12095/abstract)

**McCance and Widdowson's Composition of Foods integrated dataset (CoFID): www.gov.uk/government/publications/composition-of-foodsintegrated-dataset-cofid

*** Jenness R. 1979. The composition of human milk. *Seminars in Perinatology*. 3 (3) 225-239.

*** Ballard O *et al*. 2013. Human milk composition: nutrients and bioactive factors. *Pediatrics Clinics of North America*. 60 (1) 49-74.

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