



FrieslandCampina 

Institute
for dairy nutrition and health



Dairy and health

Questions & Answers



About this publication

Milk is part of a healthy and varied diet around the world. Milk is a natural source of essential nutrients like protein, calcium, potassium, phosphorus, iodine, vitamin B2 (riboflavin) and vitamin B12. Different dairy products such as yoghurt and cheese are made from milk.

About milk is widely spoken, especially the effects of milk on health are the subject of discussion. The information in this publication will help you find out more about dairy, nutrition and health.

This publication has been developed by the FrieslandCampina Institute for nutrition and health professionals and is based on scientific agreement and official dietary guidelines.

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What is the role of dairy in the dietary guidelines worldwide?

a few examples

United States

2-3 servings milk, yoghurt or cheese

Mexico

2 servings milk, yoghurt or cheese

Milk is globally found in many dietary guidelines and it is regarded as an important food at all life stages, from the very young to the elderly. This becomes apparent when looking at food based dietary guidelines more closely. Milk naturally contains essential nutrients, such as protein, calcium, potassium, phosphorus, iodine and vitamins B2 (riboflavin) and B12.

The Netherlands

2-3 servings milk, yoghurt or quark
40 gram cheese

Belgium

2-3 servings milk or yoghurt
20 gram cheese

The United Kingdom

2-3 servings milk, yoghurt or cheese

Greece

2 servings milk, yoghurt or cheese

Germany

200-250 gram milk or yoghurt
50-60 gram cheese

Singapore

3 servings milk or yoghurt
40 gram cheese

Thailand

1-2 servings milk or yoghurt

Malaysia

1-3 servings milk, yoghurt or cheese

Indonesia

2-3 servings of milk or yoghurt

China

2 servings milk or yoghurt

Saudi Arabia

2-3 servings milk, fermented dairy
or cheese

Nigeria

2-3 servings milk, yoghurt or cheese

Dairy products, like milk, yoghurt and cheese, are worldwide part of a healthy diet. Different dairy products are recommended in accordance with the particular culture and eating habits. In many countries adults are advised to consume two to three portions of dairy each day. However, the serving size differs between countries. For example, in the Netherlands a serving of milk or yoghurt is usually 150 ml. In the United States a serving of milk or yoghurt is 'a cup', which is equivalent to 240 ml.

What is the difference between full-fat and skimmed dairy?

The main difference between full-fat milk and skimmed milk is the fat content and therefore the calorie content. The level of nutrients in milk is independent of the fat content, and equal in full and skimmed milk.

Skimmed or semi-skimmed milk is milk from which the fat partly has been removed. This results in a lower fat content and a relatively slightly higher percentage of carbohydrates and protein in semi-skimmed and skimmed milk. The fat content of milk may differ between countries and it is subject to local legislation. Overall, skimmed milk contains about 0.5% fat, semi-skimmed milk 1.5% fat and full fat milk contains about 3.5% fat. Most nutrients are in the non-fat part of the milk and will not be affected by skimming the milk. Both full fat, semi-skimmed, and skimmed milk contain comparable amounts protein, vitamin B2 and B12 and minerals such as calcium, phosphorus, potassium and iodine. However, there is one exception. Milk fat contains vitamin A. By skimming the milk the vitamin A content will decrease. Due to the relatively higher fat percentage, cheese is a source of vitamin A.

Cheese

Typical Dutch-type cheese is made from full-fat milk. The fat content in cheese is expressed as percentage of the dry matter which are all the ingredients of cheese, without the water. In the case of full-fat cheese about 48% of the dry matter of this cheese is fat. However, because cheese also contains water, the overall fat percentage of the cheese is lower. The fat percentage of reduced-fat cheese is also lower, because these cheeses are made from semi-skimmed milk.



Is dairy also meant for adults?

By nature, cow's milk is intended for calves. However, just as people discovered that grains and eggs were nutritious and tasty, they also discovered milk centuries ago. Milk was given to children, but it appeared to be a good source of nutrients for adults as well.

Originally, people were hunters and gathered their food. However this changed with the rise of agriculture around 10,000 years ago. This transition from a nomadic society to an agricultural society spread from the Middle East through Greece and the Balkans to Central Europe. Through the centuries, our ancestors discovered that products such as apples, eggs, grains and cabbage are edible and nutritious and taste good too. They also discovered that milk from camels, horses, goats, sheep and cows is a valuable source of nutrients for people.

Adults

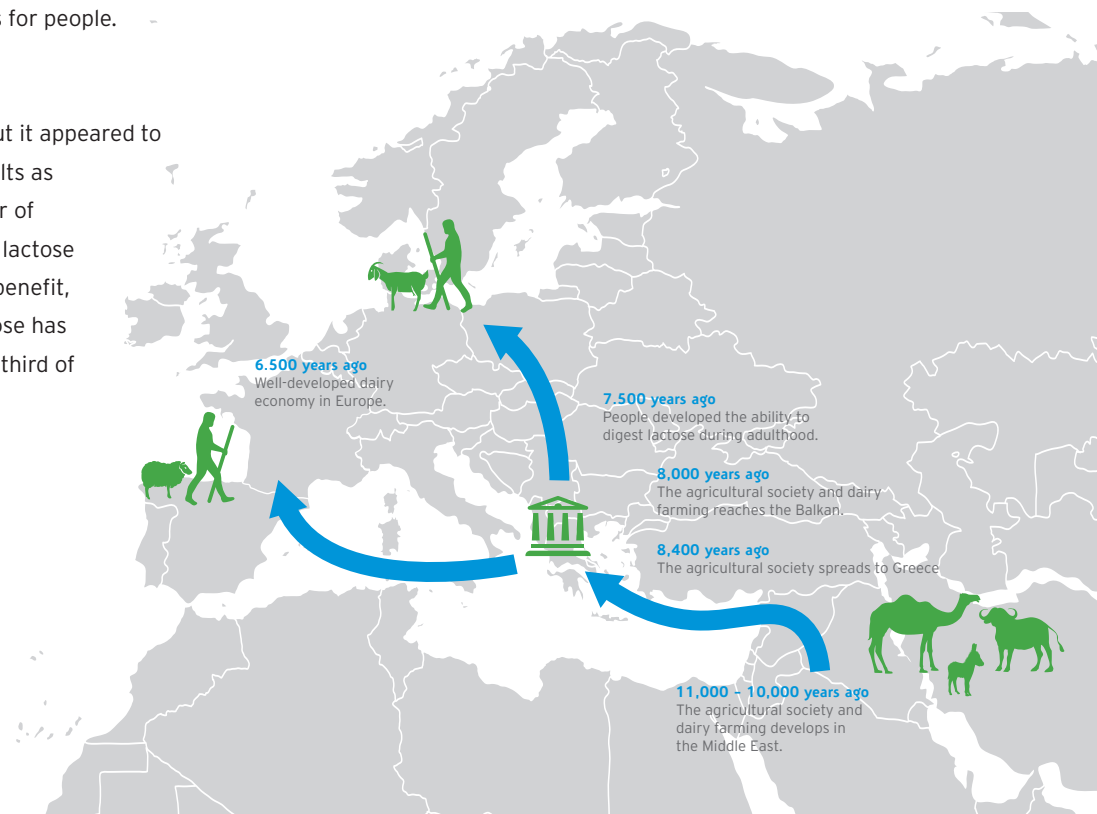
Initially, milk was given to children, but it appeared to be a good source of nutrients for adults as well. As a result an increasing number of adults developed the ability to digest lactose in milk. This offered an evolutionary benefit, the genetic adaptation to digest lactose has grown through centuries to over one third of

the world population. This is especially true in Central and Northern Europe, where dairy farming experienced a substantial growth and over 90% of the population can digest lactose.

Nutrients

The body needs energy, macronutrients and vitamins and minerals on a daily basis to function properly. A varied diet with vegetables, fruit, whole grains, nuts, legumes, meat or fish and dairy provide the body with the required quantity of energy and essential nutrients. Milk naturally contains protein, calcium, potassium, phosphorus, iodine and vitamin B2 (riboflavin) and B12.

Please read on page 12 why adults need calcium as well.



Can people with lactose intolerance consume dairy products?

Many Europeans and some populations in Africa, the Middle East and South-east Asia can digest lactose throughout life thanks to the presence of the enzyme lactase in the small intestine. This is called lactase persistence. Most people who cannot tolerate lactose can digest about 12 grams of lactose per day. This is equal to a large glass (250 ml) of milk. Yoghurt contains less lactose and semi-hard cheeses hardly contain any lactose.

Lactase converts lactose into glucose and galactose in the small intestine. A part of the world population no longer produces the enzyme lactase or to a lesser degree after childhood. This results in the lactose remaining in the large intestine partially undigested. Bacteria in the large intestine then ferment the lactose causing flatulence and may also cause gastrointestinal discomfort.

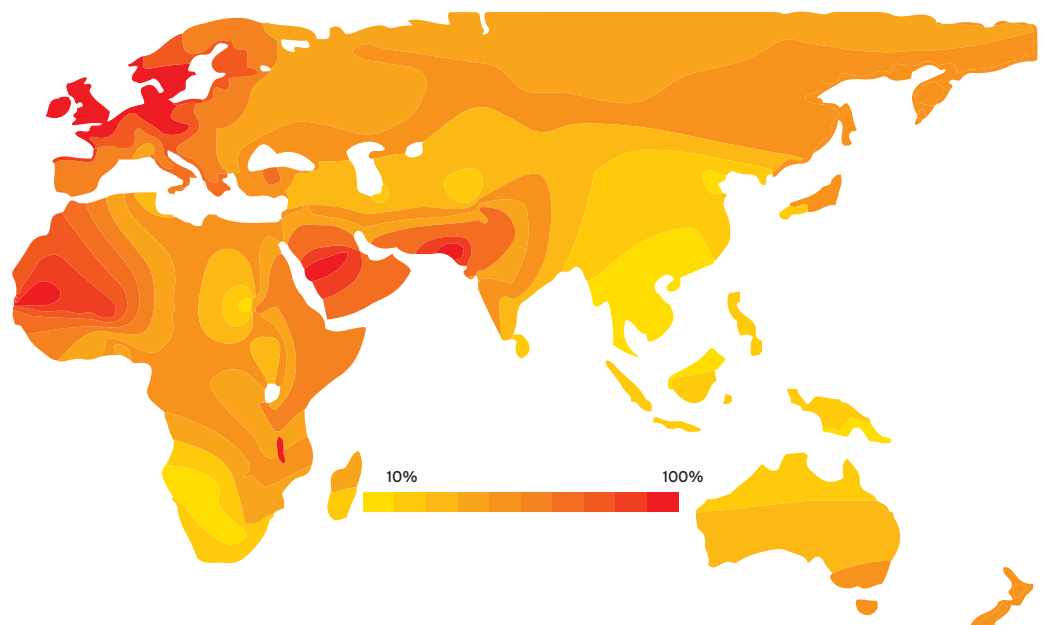
The treatment of lactose intolerance consists of omitting lactose from the diet. Usually, it is not necessary to eat completely lactose-free. Small amounts of lactose usually cause no discomfort and are not harmful. Although some people do have complaints with an intake of less than 6 g of lactose most people with diagnosed lactose intolerance can digest about 12 g of lactose per day (about 250 ml of milk) with little to no symptoms. This is especially so if consumption is spread throughout the day, taken with meals and using products with a low lactose content. As lactose is partially converted by lactic acid bacteria, fermented dairy products, for instance yoghurt, contain less lactose. Semi-hard cheeses, such as Dutch-type cheese and cheddar, hardly contain any lactose after six weeks of ripening time.

FIGURE 1 Adults with lactase persistence.

Light = in these areas the prevalence of lactose intolerance is higher. Generally, these populations have a lower lactase production and lactose digestion is more difficult.

Dark = in these areas the prevalence of lactase persistency is higher. Generally, these populations can digest lactose throughout life thanks to the presence of the enzyme lactase.

Source Itan, Y *et al* (2009)



Can children outgrow cow's milk protein allergy?

2-7% of babies and toddlers and 0.1-0.5% of adults are allergic to the protein in cow's milk. The duration of the allergy to the cow's milk protein varies, but most children will have outgrown this allergy by the age of two to three years. Although it is often stated that the number of children with cow's milk protein allergy is increasing, there is no scientific evidence to support this.

Cow's Milk Protein Allergy (CMPA) is defined as an undesirable reaction to the milk protein caused by an abnormal reaction in the body's immune system. Allergy to cow's milk protein is the most frequently diagnosed food allergy in infants and toddlers. Recovery often occurs naturally and most children grow out of their allergy. The duration of an allergy to cow's milk protein varies, but most children outgrow the allergy before they reach the age of 2 or 3 years. Despite the lack of evidence that CMPA is becoming more prevalent, the percentage of parents believing their child has CMPA (or any other food allergy) ranges from 5% to 20%. Before any dietary advice is given, an adequate diagnosis must be made by a medical professional.



Diagnosis

The diagnosis for cow's milk protein allergy starts with an examination of the clinical symptoms associated with food allergy, such as dermatological problems, gastrointestinal complaints and/or respiratory problems. Also an abnormality in a child's growth curve can be an indication of food allergy. After the physical examination, the child's diet can be examined, in particular the milk intake. The next step is an elimination diet (at least four weeks), from which all food products containing cow's milk are eliminated. A decline in complaints may indicate a cow's milk protein allergy. However, if the complaints do not decline, cow's milk can be re-introduced into the diet. This should also be done when there is an indication of cow's milk protein allergy, as an increase in complaints after re-introduction of cow's milk into the diet confirms the diagnosis for cow's milk protein allergy. This method is called a provocation test. After the diagnosis, a general practitioner or dietitian can give appropriate dietary advice.

What is the role of milk in bone health?

Genetics are a major determinant for strong bones and account for 60 to 80% of the variation in peak bone mass, i.e. the maximum bone density. Nutrition and exercise also play important roles in the development of the bones while growing (children) and in the bone tissue maintenance phase for adults and elderly people. Health authorities agree that calcium, protein and phosphorus from, among others, milk support the development and maintenance of the bones mass.

Bones consist of a protein matrix, which is filled with calcium phosphate and other minerals, such as sodium, magnesium, potassium and zinc. Bone tissue is continuously broken down (bone resorption) and built up (bone formation) for recovery after minor 'damage' and in order to adapt the bone strength to the exerted load. Bone formation exceeds bone resorption from birth up to the age of about 30 years. During this period, the bone density increases, resulting in a peak bone mass. About 95% of the adult skeleton has already been developed by the end of adolescence. The adolescence period goes with fast bone growth and about 40-60% of the adult bone tissue is developed in this period of life. Girls experience this peak moment at the age of about 12.5 years and boys when they are about 14.0 years old. From the age of 50, bone resorption starts exceeding bone formation, resulting in a decrease of the bone mineral density. With women this process goes faster due to hormonal changes. At the age of 80, the peak bone mass in women will have decreased by an average of 40-45%, whereas for men the decrease is about 30%.

Genetics

Genetics accounts for 60 to 80% of the variation in peak bone mass. Factors such as exercise and a healthy and varied diet with sufficient amounts of calcium, vitamin D and protein are important for bone health. Hormones (gender and growth hormones), ethnicity, gender, use of medicines, BMI, smoking and use of alcohol could also influence the bone mass.

Calcium

Calcium is an important building block for the bones. As 99% of the calcium in the body is stored in the bones. Next to calcium, protein, phosphorus, zinc, magnesium, and the vitamins K and D contribute to the maintenance of normal bones. These nutrients are part of the bone matrix, or in the case of vitamin D contribute to the absorption of calcium and phosphorus.

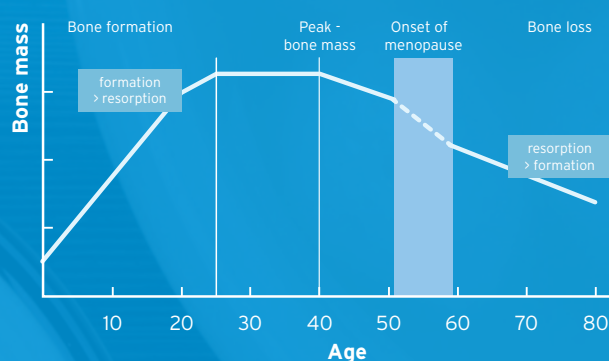
Around a decade ago a number of scientific publications stated that increased protein intake may have an adverse effect on bone health as a result of an increased amount of calcium in the

urine (hypercalciuria) and a decline of calcium in the bones. However, this is not confirmed by more recent scientific research. Only in the case of a very high protein intake, in combination with a low calcium intake, there could be an adverse effect on bone health. In practice this almost never occurs when dairy is part of the diet. It is known that excessive consumption of caffeine, carbonated drinks, alcohol and salt can have an adverse effect on the body's calcium balance.

Dairy

Milk naturally contains protein, calcium and phosphorus. These nutrients contribute to the maintenance of bone mass. This is also seen in a recent literature review of intervention and observational studies. The researchers conclude that dairy is associated with an increase in bone mass development in children and adolescents (2-19 years old). According to the researchers, this association is found due to the amount of calcium and phosphorus naturally present in milk.

FIGURE 2 Bone mass during life (women)



Source: Dawson-Hughes *et al*, 2013

Why do adults need calcium?

Calcium is the most common mineral in our bodies. There is scientific proof that we need sufficient amounts of calcium in our nutrition. This is relevant for every phase in life, both old and young. Calcium supports the build-up of bone mass with children and with adults the mineral contributes to the maintenance of bones, normal blood clotting and proper functioning of muscles and nerves.

Calcium is an important building block for the bones, as 99% of the calcium in the body is stored in the bones. Bone tissue is continuously broken down (bone resorption) and built up (bone formation) for recovery after minor 'damage' and in order to adapt the strength of the bone to the load exerted on it. A varied diet with sufficient calcium, phosphorus, protein and vitamin K and vitamin D plays a role in the maintenance of strong bones. Calcium contributes to the development of the bones while growing (children) and in the maintenance phase of the bone tissue for adults and elderly people.

Bones, muscles and nerves

In addition to the contribution made by calcium to the maintenance of bone mass, calcium supports other bodily functions as well, such as proper blood clotting and the normal functioning of muscles and nerves. When the body needs more calcium than taken in through nutrition, the calcium stored in the bones can be used to maintain the correct calcium level in the blood.

Nutrition

Dairy products, such as milk, yoghurt and cheese, naturally contain calcium. Legumes, vegetables and nuts contain calcium as well, but in smaller amounts. In a varied diet, dairy largely contributes to the intake of calcium. A glass of milk (200 ml) naturally contains about 240 mg calcium. This is more than 30% of the daily reference intake for calcium. A diet containing sufficient calcium can be composed without dairy, but this is not easy. A large portion (200 grams) of boiled broccoli contains about 70 mg calcium. Paksoi (200 grams) provides about 190 mg calcium.

Calcium recommendation*

Age	Gender	Recommended Dietary Allowance calcium (mg)
1-3 year	♂	700
	♀	700
4-8 year	♂	1000
	♀	1000
9-18 year	♂	1300
	♀	1300
19-50 year	♂	1000
	♀	1000
51-70 year	♂	1000
	♀	1200
> 70 year	♂	1200
	♀	1200

* Recommended Dietary Allowance.
Source: Institute of Medicine (2011). Local health authorities sometimes publish country-specific guidelines. Therefore, the recommended calcium intake may vary between countries.



Is a calcium supplement a good alternative to drinking milk?

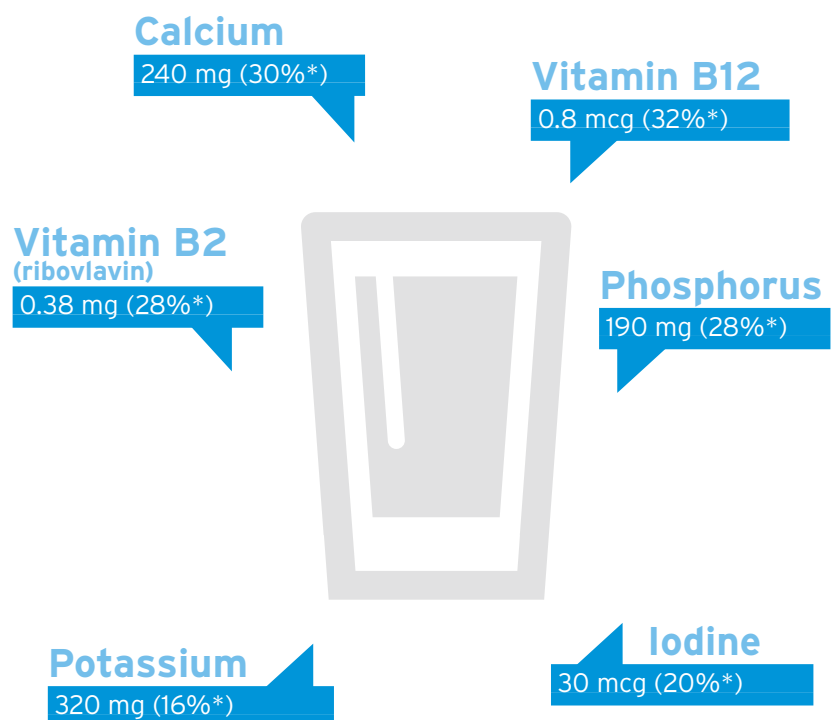
Milk provides a variety of essential nutrients such as protein, vitamin B2 and B12 and minerals including calcium, phosphorus, potassium and iodine. Therefore, milk naturally contains much more than calcium. Calcium supplements may be seen as an addition to the amount of calcium that is obtained from food, but not as an adequate replacement of a healthy and varied diet.

A varied and healthy diet with plenty of staple foods contains in general all the nutrients the body needs. Supplements can be seen as an addition to the diet and the intake of nutrients, but cannot adequately replace a healthy diet. Milk naturally provides nutrients such as protein, vitamin B2 and B12 and minerals including calcium, phosphorus, potassium and iodine. Therefore calcium supplements are not an adequate replacement of milk and other dairy products.

Low compliance

Studies on calcium supplementation show low compliance in the intake of supplements. This could be related to the size of calcium tablets and the gastrointestinal side effects which are associated with their use. People who are not eating a healthy and varied diet could believe that calcium tablets or supplements can serve as a substitute for a balanced diet and healthy lifestyle.

FIGURE 3 Vitamins and minerals in a glass of milk (200 ml)



* DRI: Daily Reference Intake

The nutritional value has been determined based on the EFSA Food composition database and Dutch food composition database (NEVO-online 2016). The average nutritional value can differ between countries. Please have a look at the country specific food composition database.

What is the effect of calcium on the absorption of iron?

Long-term studies have shown that calcium has no or just a limited effect on the absorption of iron in the body. A diet with a wide variety of food products probably contains dietary factors that promote as well inhibit the iron absorption.

People with a low iron status or pregnant women are sometimes advised to drink milk between meals instead of during meals, because it is thought that calcium in milk inhibits the absorption of iron. Science shows different insights and the associations depends on the research method. Long-term research shows no adverse effect of calcium on the iron absorption. The same applies for milk.

Research method

The absorption of iron by the body can be examined through single-meal studies or long-term research. In single-meal studies the absorption of nutrients is determined directly after the consumption of one meal, indicating the uptake of a nutrient in combination with other nutrients. However, it could be questioned how relevant these insights are in view of a complete diet including different foodstuffs. Therefore, long-term studies are preferred in order to gain more insight into the effects over a long period.

The absorption of iron depends on several dietary factors. Single-meal studies have shown that ascorbic acid (vitamin C) has a favourable effect on the iron uptake, whereas phytate, polyphenols and calcium have an inhibiting effect. However, studies involving long-term calcium supplementation show that calcium has no effect on the iron absorption. Multiple-meal

studies with a wide variety of food products and various concentrations of other inhibitors and enhancers indicate that calcium has no or only a limited effect on the iron absorption.

Dairy

Predictions of the effect of milk on the iron absorption have been made based on the calcium content of milk. The effect of milk on the iron uptake has been addressed in only a few studies, but results indicate that drinking milk has no or limited effect on the iron uptake. Although these studies did not include pregnant women, the advice that these women sometimes are given to not drink milk during meals has not been scientifically substantiated so far.

Encapsulated iron

Some food products have been enriched with iron to increase the iron intake. In order to stimulate the iron absorption in the body, sometimes encapsulated iron, e.g. iron with an extra protective layer around it, is used. As a result, the uptake depends less on other dietary factors. This is one of the technical possibilities to promote the absorption of iron.



Does drinking milk have any effect on the acid balance of the body?



In a number of scientific studies done fifteen years ago it was stated that an increased protein intake would adversely affect bone health as a result of an increased calcium content in the urine and a reduced calcium supply in the bones. New scientific findings do not endorse this effect.

According to the underlying theory of acid balance, proteins in the diet as well as phosphates increase the acidity of the blood. As a result of a slightly lower acidity (in more acidic blood) calcium is drawn from the bones as the body attempts to neutralise the blood.

No effect on the calcium balance

Although a higher protein intake does lead to a higher acid level in the urine and more calcium excretion via the urine, this has no effect on the overall calcium balance in the body, i.e. the difference between the dietary intake of calcium and excretion of this via urine and faeces. With a higher protein intake the body absorbs more calcium from food. Similarly, an increased phosphates content does not have any effect on the calcium balance.

Healthy nutrition

A diet with sufficient protein helps preserve the bones. Based on overall scientific research, the scientific panel of the European Food Safety Authority (EFSA) concluded that there is a cause and effect relationship between the intake of protein, phosphorus and calcium, and maintenance of the bone mass. Only a very high protein intake combined with a low calcium intake could possibly have an adverse effect on the bone health. However, this very rarely occurs when dairy is included in a diet. Additionally, it is known that a high intake of caffeine, carbonated drinks, alcohol and salt may adversely affect the calcium balance.

Does dairy have an effect on the health of heart and blood vessels?

Health authorities advise to consume skimmed or semi-skimmed milk and dairy products, because of the energy and saturated fat content. Recent scientific research shows that the relationship between milk and heart and blood vessels seems to be more complex than previously assumed.

All over the world milk and products made from milk are part of the dietary recommendations. Milk-fat consists of two-thirds saturated fat. Replacing saturated fat in the diet by unsaturated fat is recommended for a healthy cholesterol level and maintaining a healthy heart and blood vessels. However, milk consists of more than saturated fat. Recent scientific research indicates that a regular intake of milk and milk products has a neutral effect on the health of heart and blood vessels. The relationship between milk, and products made from milk, and cardiovascular health seems to be more complex than previously assumed.



Does milk have an effect on body weight?

Physical activity and a healthy and varied diet are important in maintaining a healthy weight. People who eat and drink more than the energy they expend will gain weight, no matter what they eat or drink. Some people believe that dairy foods like, milk, yoghurt and cheese are fattening. However science does not support this.

Research shows that dairy products, like milk, yoghurt and cheese can even play a role in maintaining a healthy weight. Studies involving energy restriction ('weight loss diets') in adults which include dairy in the diet help to improve body composition and the ratio of fat to fat-free mass in the short term. Long-term studies, without energy restriction, show that the consumption of milk and dairy products have a neutral effect on body weight. It could be explained by the nutrients in dairy, like protein and calcium. Protein contributes to growth and maintenance of muscle mass.

Consumption of dairy as part of a varied diet also contributes to a healthy body for children and adolescents.

A positive energy balance on the long term is the main cause of gaining weight. No matter what you eat or drink. Within a healthy diet you won't get fat from consuming dairy.

Does drinking milk stimulate the production of mucus in the mouth?

Increased mucus production after having drunk milk has not been scientifically proven. Nevertheless, some people find the sensation in the mouth after drinking milk unpleasant, because milk briefly coats the interior of the mouth and throat. This milky coating only lasts for a very short time and it is not the same as mucus production.

The thin layer that milk temporarily forms in the mouth is often mistaken for increased mucus production. Scientific studies do not support any association between milk and mucus production. Even when volunteers having a cold were asked to drink milk, this had no effect on the mucus production. If people find drinking milk unpleasant, they can try yoghurt or cheese. These dairy products have a different mouthfeel.



Do you get acne by drinking milk?

There is no conclusive scientific evidence for the relationship between milk and spots. This is not only true of milk, but for all foods. Spots are more likely to be caused by genetics, the environment, hormones and skin type. Professional associations of dermatologists do not give any nutritional advice for the treatment of spots.

Acne is a skin condition characterised by numerous red inflamed pimples. The pimples are caused by the hormone testosterone, which provokes the glands in the skin to produce sebum. When there is excessive sebum production pores in the skin fill with sebum, bacteria, and dead cells, resulting in the formation of

a pimple. The cause of acne seems to be factors like as skin type, genetics, hormones and environmental pollutants.

No scientific evidence has been found for the influence of a particular diet or specific nutrient on the formation of acne or acne becoming worse. The scientific studies, looking at the research methods, are of less quality. Therefore it is very difficult to determine clear relations. According to the American Academy of Dermatology there are indications that food with a high glycaemic index could be associated with the prevalence of acne. In some of these studies the participants change their diet (lower glycaemic index) and lose some weight, which can cause acne. Milk (especially skimmed milk) is sometimes suggested to be associated with acne, but there is little scientific evidence.

The American Academy of Dermatology recommend to treat acne with medication, since there is the most scientific available. Dietary changes are not part of the treatment.

What is the role of dairy in sustainable and healthy nutrition?

Due to a growing world population and increasing prosperity, the demand for good nutrition that provides an optimal intake of nutrients is growing.

This affects the environmental impact. Feeding the growing world population in a responsible way requires sustainable and healthy nutrition, or in other words, a sustainable diet. Being a staple food product, milk fits in well with a healthy and sustainable diet.

According to the FAO, the global food production should increase by 70% between 2009 and 2050 in order to be able to meet the demand for food in 2050. Dairy farming can contribute to food security if attention is paid to the sustainability of the entire production process. Milk products are globally considered to be rich of nutrients and for this reason they are part of a sustainable and healthy diet. The FAO state that a sustainable and healthy nutrition is not only represented by a healthy diet that has a low environmental impact and offers sufficient nutrients, but that it also has to fit in with the existing food culture, protect biodiversity and the environment and, additionally, be accessible, affordable and safe.

Environmental impact

The production of food has an impact on the environment (land use, water, energy, raw materials). This also holds for dairy farming. Reducing this impact is a challenge and needs a well-considered and competent approach. A method of expressing environmental impact is measuring the emission of greenhouse gases. This is also called the carbon footprint (CO₂ equivalents). The dairy sector is globally responsible for 2.7% of the total carbon footprint.

The environmental impact of the dairy chain can roughly be divided into environmental impact by raw milk production by the cow, transport of milk to the plant and processing of milk into dairy products. Within the Dutch dairy chain, the production of raw milk contributes most (about 70%) to the greenhouse gas emission. As the Dutch dairy farming sector is among the world's most productive and environmentally strictest regulated dairy farming sectors, the carbon footprint of the Dutch raw milk is relatively low with an average of 1.27 kg CO₂ equivalents per kg milk against about 2.4 kg CO₂ equivalents per kg milk worldwide. A number of manure measures and productivity improvements have reduced the environmental impact of the Dutch dairy chain. The carbon footprint of the dairy farming sector decreased by 19% between 1990 and 2013.



Land use and cows' feed

The carbon footprint of a food product is one way to express the environmental impact of a product. From the perspective of a both sustainable and healthy food pattern several factors are included, such as protection of biodiversity and the surroundings, animal health and welfare, but also things like provision of sufficient nutrients. In fact, 14.8% of the Dutch land that is used for dairy farming cannot be used for agriculture. On this land, for instance peatland, only grass is grown. Cows convert this for human beings indigestible grass into milk with a lot of nutrients and high-quality protein that is suitable for human consumption.

Another aspect is cows' feed. A Dutch cow daily eats an average of 55 kg grass (75%) and maize (25%) grown on Dutch land, supplemented with 5 kg concentrate. The concentrate consists of maize products, soy, citrus fruit, palm kernels, coleseed, beets, wheat and other residual products from the food industry. Less than 10% of the cows' feed is suitable for human consumption, the rest is only suitable for animals. The amount of protein produced by the cows is 4.38 times the amount of protein added through feed, calculated on the basis of the first milk production. Protein-rich soy bean meal that is also used for animal feed represents less than 5% of the diet of a dairy cow.



What are the nutritional differences between soy drink and milk?



Milk and soy drink are often compared with one another, but are in fact very different products in terms of origin, taste and nutritional value. Milk is a product that naturally contains important essential nutrients: protein rich in essential amino acids and vitamin B2, vitamin B12, calcium, phosphorus, iodine and potassium. Soy drink is made from soybeans (often from South America), and is a source of protein and magnesium. Many soy drinks are fortified with calcium and vitamin B2 and B12, making their nutritional value closer to that of milk.

The quality of dietary protein depends on the digestibility of the protein and the level of essential amino acids in proportion to the amino acid requirement. While the protein quality of soy drink is sufficient, milk protein contains more essential amino acids and is therefore of better quality. According to a 2013 report from the FAO detailing a new method of determining protein quality (known as the DIAAS method), milk protein scores 10%-30% higher than the highest quality soy protein isolate.

Two-thirds of the fat in milk is saturated, while for soy the proportion is only 15%. To achieve a healthy cholesterol level and thus maintain a healthy cardiovascular system, it is recommended that saturated fats be replaced with unsaturated fats. But milk consists of more than just saturated fat. Recent scientific research suggests that normal consumption of milk and milk products have a neutral effect on cardiovascular health. So the relationship between milk and cardiovascular health appears to be more subtle than previously thought.

Even though certain components of soy (lecithin and isoflavones) are sometimes linked to cholesterol reduction, the European Food Safety Authority (EFSA) considers the evidence insufficient. There are also differences in terms of micronutrients. Milk is naturally rich in calcium and vitamin B12, and is a source of vitamin B2, phosphorus, iodine and potassium. Soy has a different micronutrient profile, and is a source of magnesium. Because soy drink is often used to replace cow's milk, many manufacturers add nutrients to soy drinks. Their specific choices differ across countries. In the Netherlands, soy drink is often fortified with calcium and vitamin B2 and B12—in the US, with calcium and vitamin A and D.

The single nutrients in dairy can be substituted by other products, for example soy drinks enriched with calcium and vitamin B12. However, there are differences, for instance with respect to health effects. Therefore, health authorities all over the world recommend to consume 2-3 servings of dairy per day.

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A varied and balanced diet is
a prerequisite for good health.
As a natural source of nutrients,
milk contributes to a healthy
diet throughout all stages of life.





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