Factsheet – Food Supplements

Key Points:

- The evidence to date generally **does not support** the use of single or multi-nutrient vitamin and mineral supplements for the **prevention of cardiovascular disease, cancer or mortality** from other causes.
- Eating a **healthy, balanced diet** can provide most of us with all of the vitamins, minerals and other nutrients that we need for good health.
- Supplements are **recommended in some situations**: folic acid during pre-conception and early pregnancy; a daily supplement of vitamins A, C and D for children aged 6 months to 5 years; a vitamin D supplement of 10 micrograms/day during autumn and winter for the general population and a daily supplement of vitamin D for breastfed babies under 6 months and those who get little sunlight exposure.
- In the UK, food supplements are regulated by the **Food Supplements Regulations (2003)** and currently products **cannot make nutrition or health claims** unless on the European Commission (EC) list of approved claims.

**What are food supplements?**

There are a huge range of products that are sold as ‘food supplements’ (described as ‘dietary supplements’ in the US), which are available to buy from shops and over the Internet. These include vitamin and mineral supplements (e.g. multivitamins, vitamin E, zinc), botanical or herbal products (e.g. St. John’s Wort, Echinacea), protein supplements and many other products (e.g. glucosamine or probiotics). Food supplements are also available in a wide range of doses and forms, including tablets, capsules, powders, drinks, oils and tinctures, depending on the type of product and its intended use.

EU law provides the following definition of a ‘food supplement’:

‘**Any food the purpose of which is to supplement the normal diet and which is a concentrated source of a vitamin or mineral or other substance with a nutritional or physiological effect, alone or in combination and is sold in dose form.**’

This resource focusses on supplements containing vitamins, minerals and/or other nutrients (e.g. omega 3 fatty acids), although information on how these products are regulated is also relevant to other product types sold as ‘food supplements’.
Supplement use in the UK

According to a survey of 2,000 UK consumers (aged 16+), conducted in September 2018, **59% of consumers reported taking a vitamin, mineral or other supplement** product at some point during 2018 and 34% said they took a supplement daily (38% of women and 29% of men). **Spending on vitamin and mineral supplements in 2018 was estimated at £442 million** and popular supplements included cod liver oil and multivitamins, as well as single vitamin and mineral supplements.

Are there any recommended supplements?

The Department of Health and Social Care recommends certain supplements for some groups of people who are at risk of deficiency. The following nutrients have specific recommendations for supplementation in the UK:

Vitamin D

Vitamin D contributes to the development and maintenance of healthy bones and teeth. During the spring and summer months in the UK, the majority of the population should be able to get the vitamin D they need through sunlight exposure on the skin and by eating a healthy, balanced diet. During autumn and winter, it is recommended that **adults and children aged 5 years and over consider taking a supplement containing 10 micrograms of vitamin D**. For **breastfed infants (0-1 years), children aged 1-4, as well as people with very little or no exposure to sunlight** (e.g. those who are seldom outdoors or who wear clothes that cover most of their skin), it is advised that they take a **daily supplement containing 10 micrograms of vitamin D throughout the year**.

Vitamins A, C and D for toddlers and young children

Vitamins A and C have a range of functions in the body including supporting the immune system and healthy skin. Small children who are growing rapidly, especially those who do not eat well, may not get enough vitamin A or C from their diet, and it is difficult to get enough vitamin D from foods alone. Therefore, it is recommended that **all children aged 6 months to 5 years are given daily vitamin supplements containing vitamins A, C and D**. Babies who are having 500ml or more of infant formula per day should not be given supplements, as infant formulas are fortified with vitamin D and other nutrients. Vitamin drops containing vitamins A, C and D are available free of charge in some cases through the Healthy Start scheme.

Folic acid and pregnancy

It is recommended that **women who are pregnant, or who may become pregnant, take a daily supplement containing 400 micrograms of folic acid**, from pre-conception until 12 weeks of pregnancy. This is to reduce the risk of the baby being born with a neural tube defect (NTD).
Is there evidence that supplements reduce the risk of chronic disease?

- There are a wide variety of potential reasons why consumers may use vitamin, mineral or other supplement products, such as to increase their energy levels, lose weight or prevent a cold, although many are interested in maintaining their overall health and wellness. This includes taking a supplement to protect against the risk of chronic diseases, including cardiovascular disease (e.g. a heart attack or stroke) and cancer.

- However, the results from large randomised controlled trials, which have tested whether supplement use can reduce the risk of cardiovascular disease, cancer or all-cause mortality, have generally shown no beneficial effects. In some cases, the use of high dose supplements (e.g. beta-carotene) has been shown to have adverse effects on disease risk.

What do trials on supplements show?

A number of reviews and meta-analyses (where data from a number of studies are analysed together) have looked at the effects of taking vitamin and mineral supplements on the risk of chronic disease.

- A recent meta-analysis of over 200 trials (published in May 2019), including almost 1 million participants, found no significant effect of supplements on mortality or cardiovascular disease outcomes.

- A comprehensive review and meta-analysis of data from 179 randomised controlled trials (published in 2018) analysed the effect of 14 vitamins and minerals separately, as well as combined (multivitamins, B-complex vitamins, and antioxidants), on the risk of cardiovascular diseases (coronary heart disease, heart attack or stroke) and all-cause and cardiovascular disease mortality. Overall, no conclusive evidence was found that the supplements included were beneficial for the outcomes studied. While some evidence was found that B vitamins and folic acid might reduce cardiovascular disease, and that folic acid might reduce stroke, the significance of this was driven by the results from a large study in China, and further research is needed to confirm these findings.

- In 2014, the U.S. Preventive Services Task Force concluded that there was insufficient evidence to assess the balance of benefits and harms from using single, paired (e.g. vitamin D and calcium) or multi-nutrient supplements (containing 3 or more vitamins/minerals) for the prevention of cardiovascular disease or cancer. The Task Force recommended against the use of beta-carotene or vitamin E supplements for the prevention of cardiovascular disease or cancer.

- A Cochrane review (an in-depth systematic review) published in 2012, which assessed the evidence for antioxidant supplements (beta-carotene, vitamin A, vitamin C, vitamin E, and selenium), and included 78 randomised controlled trials, found there was no evidence to support their use for reducing the risk of mortality.

A number of controlled trials have also been conducted on specific nutrients including folic acid, vitamins E and A, calcium, vitamin D and omega 3 fatty acids, investigating whether they can reduce the risk of disease. Generally, these have not provided strong evidence that single nutrient supplements can have a beneficial effect on the risk of conditions like cardiovascular disease or cancer.

Why do many trials show no beneficial effect of supplements?

- One area of confusion on the evidence for supplements and risk of disease is that some observational studies (where large groups of people are followed over time) have found beneficial effects, which have not then been found in randomised controlled trials. The reason for inconsistencies in the findings is most likely because people who use supplements tend to be healthier in other ways.

- Studies have shown that supplement users often have a higher level of education and income, and tend to have a healthier lifestyle overall, including higher levels of physical activity, not smoking,
drinking less alcohol and maintaining a healthy weight – all of which are associated with a reduced risk of chronic disease.

- Supplement users may also have a **better quality diet** than non-users, and so have **higher nutrient intakes from foods**, which may lower their risk of chronic diseases without the need for supplement use.

- The effects of nutrients from supplements versus food were explored in an observational study of over 30,000 US adults published in 2019, which looked at nutrient intakes from both food and supplements. Single or multi-nutrient supplement use was not associated with a lower risk of all-cause, cancer or cardiovascular disease mortality, after taking into account education and lifestyle factors. However, an **adequate intake of some nutrients from food sources** (vitamin A, vitamin K, magnesium, zinc and copper) was associated with a lower risk of all-cause or cardiovascular disease mortality.

**Eating a healthy balanced diet**

Eating a varied and balanced diet can provide most people with all of the essential vitamins, minerals and other nutrients needed for good health, as well as other important dietary components, such as fibre, which is important for maintaining gut health, as well as reducing the risk of diseases like type 2 diabetes, cardiovascular disease and some cancers. The UK’s healthy eating guidance, the [Eatwell guide](#), applies to most people over 5 years of age.

National surveys show that for some population groups there are potential concerns about intakes and status of some vitamins and minerals (further details available [here](#) and [here](#)). In some cases, these are reflected in the population recommendations for supplements such as vitamin D or folic acid, outlined above, and low intakes of a number of nutrients (for example in teenage girls) may indicate a need for an improved dietary pattern overall. For individuals where a deficiency of a specific nutrient is identified, this would be treated either by suggesting changes to the diet or prescribing supplements or other treatments, for example in the case of iron deficiency anaemia.

**How are food supplements regulated?**

- There is no requirement to register food supplements in the UK, as long as they comply with all relevant food laws and they are sold by a registered food business operator, who is responsible for ensuring that the products they sell are not harmful to the consumer.

- In the UK, food supplements are regulated under the [EC Food Supplements Directive 2002/46/EC](#), which is implemented in national law by the [Food Supplements (England) Regulations 2003](#). This includes certain information that must be included on the label (see below).

- Any nutrition (e.g. ‘source of vitamin C’) or health claims (e.g. ‘reduces tiredness’) made on food supplement packaging must be approved for use within the EU. A list of approved nutrition and health claims is maintained by the European Commission. The science behind health claims is reviewed by the [European Food Safety Authority (EFSA)](#), which is then assessed by the European Commission, who authorise or reject the claim, including specific conditions for the use of an authorised claim.

- Although the UK does not have any legislation that sets maximum levels for vitamins and minerals in food supplements, there are guidelines for **safe upper intake levels**, which were set in 2003 by the Committee on Toxicity (COT) [Expert Group on Vitamins and Minerals](#).
Key messages

- In general, eating a balanced and varied diet should provide sufficient amounts of the vitamins, minerals and other nutrients that we need, as well as important dietary components such as fibre and natural bioactive compounds, such as polyphenols, without the need for supplements. It is important to remember that supplements should not be used as a substitute for a healthy diet.

- There are some cases where supplementation is recommended, such as taking a folic acid supplement during pre-conception and early pregnancy, a daily supplement containing vitamins A, C and D for children aged 6 months to 5 years, and advice to consider taking a vitamin D supplement (10 micrograms per day) during the autumn and winter months.

- If you are considering taking a supplement, it is a good idea to speak to your doctor or another healthcare professional (e.g. dietitian or pharmacist), who will be able to advise on whether it is necessary for your specific needs or health status, and any issues to be aware of (e.g. interactions with prescribed medications).

- It is a good idea to buy from a reputable company, such as your local chemist, supermarket or a high street retailer, to ensure that the product meets the UK requirements for safety (see above).

- Always read the label and make sure not to exceed the recommended dosage.

- While most supplements are generally safe when taken as advised, they can be expensive and many are not supported by a robust body of evidence to show that they reduce the risk of chronic disease.