

A to zinc: What supplements are worth taking?

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Vitamins, minerals, fish oils... the list of nutritional supplements you can buy keeps growing. Some are worth it, some aren't. We sift the evidence for you.

IN 1911, Polish chemist Casimir Funk made one of the most influential biomedical discoveries of all time. He learned that a disease called beriberi affected those who ate a diet of mainly white rice, but not those who ate mostly brown rice. He isolated a chemical from rice bran, showed it could prevent beriberi, and called it "vitamine".

We now call that compound vitamin B1. It is one of many essential nutrients that the human body cannot produce in sufficient quantities and that we must obtain from food. Casimir's breakthrough led to similar discoveries, including the compounds that prevent scurvy and rickets. In 1920, the British chemist Jack Cecil Drummond proposed dropping the "e" and using the umbrella term "vitamin".

Early success at identifying, preventing and curing nutritional deficiencies naturally led to the idea that dietary supplements were good for everybody. Science now recognises around a dozen essential vitamins, as well as some 20 minerals considered essential in small amounts. In the US, iodine was added to table salt in 1924 to prevent goitre, vitamin D to milk in 1933 to prevent rickets, and several vitamins and minerals were added to flour in 1941.

Public awareness of vitamins grew, and with it, a desire to take personal control. Single vitamin supplements became available in the US in the 1930s, and multivitamins went on sale a decade later.

Though health authorities emphasise that most of us should be able to get all of the vitamins and minerals we need from a balanced diet, the industry has boomed. The list of supplements now numbers in the hundreds. It is estimated that about half of the US population now takes some form of supplement each day, while nearly a third of people in the UK do the same. All those pills and powders add up: the industry is worth roughly \$30 billion in the US, and some £675 million in the UK.

But in recent years doubts have emerged over whether these supplements actually work, and whether they are always safe – particularly when they supply vitamins that can slowly build up to dangerously high levels in body fat. Over the next five pages, we look at the latest evidence for and against the 20 most popular.

The information in this feature summarises published research and guidance and is not intended as individual medical advice.

ICON KEY

-  Not enough evidence
-  Some people could benefit
-  Potential harms
-  No evidence of harm, but no benefit
-  Good evidence
-  Ask your doctor

Vitamin A

Back in 1500 BC the ancient Egyptians noted that eating liver cured night blindness. Only in the early 20th century was it discovered that this was due to vitamin A.

"Vitamin A" is an umbrella term for several compounds, including retinol and retinoic acid, that we get from our diet. It is vital for growth, vision and development. Dairy products and fish oils are rich sources. Provitamin forms, such as the orange pigment beta carotene, get converted into vitamin A in the body. Just half a carrot meets your daily need for 0.6 to 0.7 milligrams.

Yet some supplements provide higher doses, and we store the surplus away in fat, where it can build

up to harmful levels. An intake of more than 1.5 milligrams a day on average may interfere with beneficial effects of vitamin D and weaken bones, too.

Vitamin A deficiency is the main cause of preventable blindness in children who are persistently malnourished. In the well-fed West, however, researchers wondered in the 1980s about the benefits of a little extra. The epidemiologist Richard Doll noted that cancer risk seemed to drop with higher blood retinol levels.

But since then several well-designed trials, and a recent meta-analysis, have failed to show any benefit from taking extra. In fact, they suggest supplements may increase the risk of cancer and death. *Alison George*

VERDICT: Avoid vitamin A supplements unless you have a diagnosed deficiency.



B vitamins* (B1, 2, 3, 5, 6, 7 & 12) * See also "Folic acid", below

All the B vitamins are essential to the process of turning food into energy.

In malnourished populations, too little vitamin B3 can cause the diarrhoea, skin lesions and dementia symptomatic of the disease pellagra. People in the West, however, can easily get all the B vitamins needed from their diet. Vegetarians and vegans are the exception, as B12 is found naturally only in meat, eggs and dairy products.

But can a little extra benefit others as well? Supplements of B vitamins are claimed to help prevent heart disease, stroke and cognitive decline, as they reduce levels of homocysteine, a blood compound that may play a role in these conditions. But randomised trials fail to support the idea.

Recent reviews found that folic acid, B12 and B6 did lower homocysteine levels, but this had no effect on mental abilities. Another large analysis found no benefit of the three compounds, either alone or in combination, against heart disease. *Clare Wilson*

VERDICT: For vegans or vegetarians, B12 supplements may be a boon. Omnivores, not so much.



Vitamin C

It's the vitamin everyone loves to love, and the most popular single vitamin supplement in the US. But unless you're doing subarctic military training, a daily vitamin C tablet will not ward off colds. Nor will it protect you from cancer, as some claim.

Our bodies don't make vitamin C, so we need to consume it. It helps us absorb iron and make collagen, a protein that helps wounds heal. Without enough, you could succumb to the bleeding gums and weeping wounds of scurvy, like seafarers of old. Adults require at least 40 milligrams of vitamin C each day, which is easily achievable by eating foods like peppers, broccoli and strawberries. A single orange covers your daily needs.

So how did taking extra vitamin C to prevent colds become so popular? We can thank Nobel prizewinning chemist, Linus Pauling, who became obsessed with it as a wondrous cure-all. Too bad the evidence is less inspiring: a recent review found that taking 200 milligrams of vitamin C every day may reduce the severity and duration of a cold, but it won't prevent it in the first place – at least not unless you're a soldier training in extreme cold, a marathon runner or a competitive skier.

A little extra vitamin C is unlikely to harm you, but megadoses may cause diarrhoea, heartburn and other problems. The upper recommended limit for daily intake is about 2000 milligrams.

Pauling also thought vitamin C could help cure cancer. There is some anecdotal evidence that people with cancer given high doses intravenously survived longer than expected, but it is

impossible to say whether that was because of the vitamin. Higher-quality research into its preventive effects is more damning: large-scale trials have found no evidence of reduced cancer risk. Epidemiologist John Potter at the Fred Hutchinson Cancer Research Center in Seattle, Washington, sums it up this way: "My interpretation is that vitamin C is null for most things, including cancer." *Jessica Griggs*

VERDICT: It won't prevent colds but if you've caught a cold, taking daily vitamin C may help you recover faster.



Chromium

For chromium content, broccoli is king. But if you loathe the green florets, don't despair. A diet rich in fruits and vegetables should give you enough.

If you need it at all, that is. Whether or not chromium is a dietary essential is hotly debated. The assumption that we need it is based on unexpected weight loss and other health problems seen in people on long-term intravenous diets lacking in the mineral. For now, scientists presume that we need it, and look to how much healthy people get as a guide. This "adequate intake" is 25 to 35 micrograms for adults.

Millions in the US take chromium supplements, probably lured by claims that it can burn fat and reduce insulin insensitivity. But the pills probably aren't worthwhile for everyday people.

Last year a review of studies found "no current, reliable evidence" that chromium can help overweight adults slim down. There is also no clear evidence that it can enhance insulin action and mediate blood glucose, and the US Food and Drug Administration says such benefits are "highly uncertain". Other claims, that it raises "good" cholesterol and lowers heart attack risk, also lack solid evidence.

If you so wish, taking 10 milligrams a day or less should be fine, according to the UK National Health Service. *Jon White*

VERDICT: There are health claims aplenty for chromium supplements. Unfortunately, that's about all they are.



Vitamin E

We need vitamin E to help prevent clots and maintain immune defences. The daily intake recommended for adults is 3 to 4 milligrams in the UK, 15 milligrams in the US. Either way, you should get plenty from vegetable oils, nuts, seeds and green veggies.

Vitamin E deficiency in otherwise healthy people is rare – even getting slightly less than you need doesn't appear to cause harm – but because we store it up in fat, it can impact those who have conditions which interfere with the body's ability to digest or absorb fat, such as Crohn's disease or cystic fibrosis. Deficiency can lead to muscle weakness and vision problems, and over prolonged periods can undermine liver and kidney function.

Because vitamin E is an antioxidant – which can neutralise harmful free radicals that are a by-product of cellular metabolism – it has been suggested that taking high levels in supplements should help prevent cancer and other diseases associated with free-radical damage. But the evidence doesn't support this, and in what has become known as the "antioxidant paradox", researchers suggest this may be because our bodies marshal free radicals to kill bacteria and cancer cells. A surge of antioxidants from supplements may let these nasties off the hook.

Indeed, in high doses vitamin E supplements may increase the risk of prostate cancer. (Because it is fat-soluble, we can unwittingly build up gradually to worryingly high doses.)

With regard to other conditions – ranging from heart disease to age-related macular degeneration

and dementia – again there is no evidence of benefit.

Also, despite the popular belief that vitamin E applied as a topical cream or gel can make scar tissue less conspicuous, research doesn't bear this out. *Tiffany O'Callaghan*

VERDICT: Don't take supplements unless you have been diagnosed with vitamin E deficiency, probably related to another condition.



Calcium

We all know that calcium is important for strong bones and teeth. That's why we need at least 700 milligrams each day. Dairy products are a great source, as is salmon. People who are lactose intolerant or vegan may struggle to get enough, though. That's a worry: in the long term, too little calcium may lead to bone fractures and osteoporosis.

That may be why half of US adults take some form of calcium supplement. Until recently, the pills were also recommended to postmenopausal women. But new evidence suggests their benefits may be overshadowed by significant health risks.

Bone mass declines after age 35, making you more vulnerable to fractures as you get older. Extra calcium can help: an analysis of 17 clinical trials found that supplements lowered fracture risk by about 24 per cent.

These types of findings led a US National Institutes of Health consensus panel to recommend in 2001 that older adults use supplements. The trouble is, since then, a load of studies have highlighted problems.

For a start, too much calcium from supplements can cause kidney stones. But of graver concern are risks to the heart. A five-year trial of post-menopausal women found that those taking the supplements were more likely to suffer a heart attack or stroke than those who didn't. A subsequent analysis confirmed the increased risk.

As a result of such studies, medical advice is changing. Last year the US Preventive Services Task Force changed its guidance to recommend against the combination of calcium and vitamin D supplements for post-menopausal women. *Jessica Hamzelou*

VERDICT: We need plenty of calcium. But for many people, taking supplements to get a boost may bring health risks.



DHEA

"The super-hormone wonder drug!" "Elixir of youth!" DHEA (dehydroepiandrosterone) may be advertised as a miracle cure, but there's not enough solid evidence for doctors to recommend this little pill to anyone – yet.

DHEA is the most abundant steroid in our blood and helps to produce other important steroids. It declines as we age.

Where does it get its extraordinary reputation from? Fifty years of animal studies show DHEA can help ward off allergies, boost fertility and even extend life. But trials in humans have failed to live up to the hype.

That's not to say DHEA hasn't got promise. Early evidence suggests it may reduce wrinkles, as it appears to stimulate an enzyme used to produce collagen. And small trials in the elderly show that DHEA supplements improve quality of sleep, bone density and psychological well-being.

Promising pilot studies also show that DHEA reduces the symptoms of inflammatory bowel disease and asthma, but these have not been followed up. (It is naturally produced in the body and therefore

cannot be patented, so big pharma has little interest in funding trials.)

Finally, for people with adrenal insufficiency, DHEA may increase libido by helping to boost flagging hormones. But it may not be the right elixir for your love life. Another study showed no benefits to sexual function, only more blemishes, greasy skin and excess hair growth.

Side effects of taking DHEA are usually minimal, but it is not advisable for those at risk of hormone-dependent cancers. *Helen Thomson*

VERDICT: It holds promise, but the jury is still out.



Vitamin D

Many people know that vitamin D deficiency causes the bone disorder rickets. But they may not realise that it has also been linked to an increased risk of autoimmune diseases, and greater susceptibility to viral infections. A recent study found that, compared with those with the highest levels, people with very low vitamin D are at 57 per cent greater risk of death from all causes.

Vitamin D is unique among vitamins in that we can make our own through the action of sunlight on our skin. In the summer, light-skinned people can get more than enough each day by spending 5 to 10 minutes in the sun wearing minimal clothing. Darker-skinned people need to spend about 30 to 40 minutes. If you live north of San Francisco or south of Melbourne, Australia, this won't work during the winter, however. You can also get vitamin D from food; oily fish is one of the best sources.

About half of adults in the UK and US are thought to be deficient in vitamin D. Do we need supplements? Most guidelines agree that young children, pregnant women and elderly people should take them – and possibly other adults if they don't get out in the sun much. Recommended daily intake is about 15 micrograms, but experts say up to 100 micrograms per day is probably safe. Too much vitamin D can cause calcium to build up in the blood, which can result in vomiting and kidney problems. *Linda Geddes*

VERDICT: Pregnant women and the elderly are advised to take supplements.



Fish oils

The fish oil business is booming, with US sales worth more than \$1 billion a year. The pills contain omega-3 fatty acids, including eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). Made naturally only by marine algae and diatoms, they build up in fish that eat the algae (or that eat smaller fish which do). We need omega-3s, among other things, as building blocks for nerve and brain tissue.

The vital role of DHA in forming the brain and nervous system in embryos and infants is undisputed, but recent studies find that elderly people may benefit too: those with higher levels of EPA and DHA in the blood tend to have greater brain volume, particularly in areas associated with memory.

Fish oil capsules do have their critics – some studies have found the evidence for benefits is limited. But the bulk of the evidence points to benefits to heart health – 1 gram of fish oil per day can cut the risk of death by heart attack by as much 20 per cent.

Health authorities around the world recommend a minimum intake of 250 milligrams each day, and set no upper limit on daily intake. *Andy Coghlan*

VERDICT: It's probably best to fill up on fish oils with oily fish (say that three times fast!). If you aren't a fan, capsules are a backup.



Glucosamine

Glucosamine is found in the body as a building block of cartilage and a component of the fluid around joints. No surprise, then, that supplements are often touted as a remedy for arthritis. In animal studies, glucosamine has been shown to decrease pain and inflammation and slow the erosion of cartilage. Study methods vary hugely, though, making it difficult to say anything conclusive.

Small trials in humans suggest a daily pill can reduce arthritis pain and inflammation, but meta-analyses find little difference between glucosamine and placebo. That said, they also find no difference in harm between the two. So glucosamine may not help much, but is unlikely to make matters worse.

Still, the UK's National Institute for Health and Care Excellence (NICE) recommends against glucosamine for arthritis, because of the lack of strong evidence and the potential risk factors. People with shellfish allergies, hypertension or diabetes should avoid it: glucosamine supplements are often derived from shells of shellfish, some formulations are stabilised using a lot of salt, and there is some evidence that glucosamine can hinder the body's ability to process glucose.

VERDICT: For most people, taking glucosamine to tackle arthritis won't hurt – but there's not enough evidence to say it will necessarily help either.



Vitamin K

Vitamin K supplement sales are booming thanks to the promise that it can boost bone strength. Is there truth behind the hype?

Vitamin K comes in two forms: K1, found in leafy green vegetables; and K2, synthesised by bacteria in our gut. It is best known for its major role in blood clotting (its name is derived from its original German title, Koagulationsvitamin). The very rare cases of deficiency in adults are associated with uncontrolled bleeding. It can interfere with blood-thinning medications, so doctors recommend against supplements for people taking these.

Depending on body weight, we need around 70 micrograms of vitamin K a day, which we can easily get from a single serving of broccoli. Newborn babies are often deficient, however, so are usually given a booster injection after birth to prevent bleeding problems.

But it is its role in our bones, not our blood, that has led to vitamin K's recent rise in popularity. A number of studies have linked low levels with osteoporosis and increased risk of fractures.

So far there are only a handful of small studies of vitamin K supplements, and not all point the same way: some suggest extra vitamin K promotes bone health, while others find it makes no difference.

VERDICT: Too early to tell.



Folic acid

Along with vitamin B12, folic acid – also called vitamin B9 or folate – is important to the formation of red blood cells. It is also believed to be critical to production of DNA and RNA.

Adults need 200 to 400 micrograms daily. Leafy greens, salmon and several types of bean are good sources.

During pregnancy the recommended intake is 400 to 600 micrograms per day, or more for women with a family history of fetal abnormalities such as spina bifida, in which there is a gap in the spine. This is due to a defect in the neural tube, a structure that forms in early pregnancy. Taking folic acid

before conception and in early pregnancy reduces the risk of neural tube defects by as much as 70 per cent.

More than 70 countries – including the US, Canada and Australia, although not the UK – require that flour and cereals be fortified with folic acid. Since fortification became widespread in the US in 1998, the number of babies born each year with a neural tube defect has dropped. But fortification cannot eliminate the problem – neural tube defects still affect roughly 3000 US pregnancies yearly – so pregnant women are advised to take supplements, even in countries that do fortify.

There is less evidence to back other people taking folic acid supplements. Like vitamin B12, folic acid helps break down homocysteine, an amino acid in the blood which, at high levels, can increase the risk of heart disease. Yet an analysis of several studies found not only that daily supplements did not reduce rates of heart disease or stroke, but also that the risk rose in individuals who had high homocysteine levels to begin with.

VERDICT: Folic acid supplements are advised during pregnancy. Otherwise, you should get enough from food.



Iron

Iron is essential to all life. It is a major component of haemoglobin, the protein that transports oxygen in the blood. It also forms a core part of various proteins involved in metabolism, immune response and the production of neurotransmitters. This makes it critical for basic cellular functioning and brain development, and well as ensuring that enough oxygen is delivered to our tissues.

It's relatively easy to get the daily recommended adult intake of 8 milligrams (pre-menopausal women need at least 15 milligrams), as many common foods contain at least some iron. Meat and fish are good sources, as are beans, dried fruit and tofu.

But some sections of the population are at risk of iron overload. Iron is highly reactive in the body, and easily forms free radicals that will damage cells if its availability isn't tightly regulated. Those at risk include heavy drinkers, people with inflammatory conditions like rheumatism, carriers of certain genetic mutations and those with a long history of taking iron supplements. This may boost their risk of type 2 diabetes and certain cancers.

Most people will be familiar with the idea that anaemia stemming from iron deficiency can lead to tiredness – this fact is often slapped on the packaging of iron supplements. But anaemia can also blunt your immune response and cloud cognition. A recent study found that boosting iron levels in healthy women whose iron levels were on the low end of normal did indeed reduce tiredness. What many people don't realise is that iron overload can also make you tired – so it's worth seeking medical advice before popping iron supplements to combat everyday fatigue.

VERDICT: Before taking iron supplements, talk to a doctor: too much or too little can cause problems.



MSM

MSM (methylsulphonylmethane) is a sulphur-containing compound found in meat, vegetables and other foods. Our bodies need sulphur to make proteins, but it is unclear how much we need for health.

MSM supplements have been touted as useful against ailments from cancer to brittle nails. But very little published research has put MSM to the test: a detailed search yields more patents than studies.

Most clinical trials of MSM to treat osteoarthritis have been poor-quality, but three of the most

rigorous found no significant effect on joint pain. As for claims that it can reduce cancer risk, so far research has been limited to cells and rodents. In 2010, the European Food Safety Authority assessed claims for taking MSM for healthy hair, nails, bowels, metabolism and immune function. It found that there was not enough evidence to support any of them. So while MSM is not thought to be harmful, there seems little point in taking it.

VERDICT: There is no evidence that MSM is necessary for health.



Magnesium

Many enzymes require magnesium, including those involved in nerve and muscle function and in regulating blood glucose and blood pressure.

Are we getting enough? A balanced diet should provide the recommended 300 milligrams a day. Nuts and spinach are good sources. But in the US, teenagers and people over 70 often get too little, partly because of a diet high in processed food for the former and poor absorption of the mineral in the latter.

Although a consistently poor diet, diabetes and certain medications can lead to a severe lack of magnesium and symptoms such as heart arrhythmia, it is rare for deficiency to cause illness. The evidence is sketchy on the benefits of supplements, beyond treating such extremes. Up to 400 milligrams a day should be fine, but any more can lead to diarrhoea. (Some laxatives and antacid tablets contain large amounts of magnesium.) Very high doses – more than 5 grams per day – can cause difficulty breathing and even heart attack.

Sales of magnesium supplements in the US were reported to be worth \$430 million in 2011. If you Google "diabetes and magnesium", you might be led to think that supplements are the way to avoid diabetes, or at least ease it. Despite this, so far there is no clear evidence of benefit against diabetes. Some research suggests a protective effect for stroke and heart disease, but when it comes to other health claims for magnesium, including lowering blood pressure, studies show a very small impact, if any. Finally, for treating migraine, there is no clear consensus for or against.

VERDICT: Unless you have a diagnosed deficiency, don't rush out to buy this supplement.



5-HTP (5-hydroxytryptophan)

An amino acid produced in the body, 5-HTP regulates levels of the neurotransmitter serotonin in the brain. Proponents of 5-HTP supplements claim they can increase energy and even treat depression. There is some evidence for the latter claim, at least, but 5-HTP may not be worth the risk.

A 2009 analysis of 111 published trials of 5-HTP found just two that met rigorous standards. These suggested it may be better than placebo for depression, but the researchers would not recommend it: they also noted that the supplements may be linked to a very rare but potentially fatal syndrome known as eosinophilia-myalgia, a condition that causes incapacitating pain.

A dose of 5-HTP may also throw other brain chemicals out of balance, and lead to side effects such as anxiety.

VERDICT: There isn't enough evidence to prove that 5-HTP can enhance your mood, but there is enough to suggest it may be harmful.



Coenzyme Q10

The many claims made by proponents of coenzyme Q10 (CoQ10) – that it can help treat heart failure, cancer and diabetes, improve sperm quality and even help you live longer – stem from the fact that the compound plays a crucial role in almost every cell in the body. As a rule, coenzymes help enzymes do their job: in this case, the enzymes that produce energy in our cells.

In small studies, CoQ10 boosted immune function in people with cancer and HIV, prevented heart damage caused by some chemotherapy drugs, and improved heart function in people recovering from heart failure.

But other claims fail to stand up to scrutiny. A 2010 analysis by the European Food Safety Authority dismissed most as lacking in evidence, including claims that CoQ10 can boost energy.

So how much do you actually need? There are no recommended daily intakes, but one study found that adults consume about 3 to 5 milligrams per day. Most of us get all the CoQ10 we need from our own bodies and from what we eat: liver and oily fish are good sources.

Deficiency is rare and usually associated with neurodegenerative disorders, conditions like kidney disease or genetic mutations which prevent the body from making the coenzyme.

VERDICT: Supplements may have promise in the clinic, but for now, many health claims are little more than CoQ-and-bull.



Selenium

Selenium is a trace element found in fish, meat, grains and dairy products. It is crucial to the formation of selenoproteins, which are vital for DNA production. In the West it is very rare for people to lack selenium; an adult only needs about 60 micrograms per day, which a portion of fish or a single Brazil nut can supply.

Selenium can be poisonous in large doses, but the most prominent case of toxicity involved people taking supplements containing more than 200 times the recommended daily intake. Most supplements contain 50 to 200 micrograms. It is claimed that they can help prevent illnesses like cardiovascular disease and cancer, and also stave off age-related cognitive decline.

Research into whether selenium supplements could lower the risk of some cancers has been contradictory, leading the US Food and Drug Administration to deem the evidence inconclusive.

Selenoproteins reduce inflammation and stop blood platelets clumping together, so selenium could be beneficial against cardiovascular disease. But again, the evidence is mixed. A review of 12 trials did not support this claim, and some trials even suggest high selenium intake could increase risk. The results are equally opaque for thyroid disease, and when it comes to preventing cognitive decline, promising findings have been muddled by poorly controlled experiments.

Catherine de Lange

VERDICT: Keep an eye out for future research, but for now a few Brazil nuts will keep you covered.



Potassium

Potassium works in tandem with sodium to regulate the volume of blood in our body, and helps us get rid of excess salt – and with it, excess fluids – through urine.

High blood pressure is a major cause of heart disease. And the popularity of processed foods, which tend to be high in salt and low in potassium, adds to the problem. In healthy people, the ratio of sodium to potassium should be roughly 1:1. So how do we get the 3.5 grams per day recommended

by the World Health Organization? For most of us, it's down to – you guessed it – eating fresh fruit and vegetables.

Still, supplements are popular – sales are worth close to \$90 million a year in the US. The pills are occasionally prescribed for people who have trouble absorbing potassium naturally, but in otherwise healthy people potassium deficiency, characterized by fatigue and muscle weakness, is very rare. Supplements may pose a risk for people with high blood pressure or certain kinds of kidney disease that mean they cannot get rid of potassium, but otherwise are unlikely to cause harm.

Douglas Heaven

VERDICT: For most people potassium supplements aren't worth it. Try a banana instead.



Multivitamins

They are marketed as "dietary insurance", and each year multivitamins bring in \$5.2 billion in the US. But the evidence suggests this is mostly money down the drain.

People with conditions that affect absorption of essential nutrients, such as Crohn's disease, may benefit from multivitamins. The supplements may also be good for people with poor diets. (Ironically, though, it's those who least need them that tend to top up.)

A recent trial did point to a slightly decreased cancer risk for men taking multivitamins. But it found no impact on cardiovascular health, and the results of many other studies looking at possible benefits are a total muddle. In the end, the US National Institutes of Health has concluded that there just isn't enough evidence in favour. Experts echo this point of view, adding the concern that, beyond being ineffective, supplements that contain high doses of vitamin A or vitamin E may even cause harm.

VERDICT: For healthy people with a balanced diet, multivitamins are generally a waste of money.



Zinc

Oyster lovers, rejoice! Zinc plays a vital role in cell division, is required for about 100 enzymes to work, helps with metabolism, wound healing and the production of DNA – and oysters provide more per serving than any other food.

The daily recommended amount is 4 to 11 milligrams. Too little can result in a weakened immune system, hair loss and mental slowness.

Some evidence suggests zinc supplements can slow age-related macular degeneration and perhaps also help with symptoms of sickle-cell anaemia, but more research is needed.

The role of supplements is clearer when it comes to colds. A recent review found that doses of 75 milligrams a day or more, if taken within a day of getting sick, shortened the length of a cold. There is no evidence that supports taking them routinely, however.

VERDICT: Once you're sick, zinc may cut short a cold. But there is no reason to pop a daily pill.



Know your B vitamins

We need B vitamins each day, because we excrete any extra in urine. Some of the things they do, and foods you can find them in:

B1 (thiamin)	Sources: whole grains, eggs Action: aids muscle and nerve function
B2 (riboflavin)	Sources: dairy, eggs, rice Action: keeps skin, eyes and nervous system healthy
B3 (niacin/niacinamide)	Sources: liver, fish, whole grains Action: maintains the nervous and digestive systems
B5 (pantothenic acid)	Sources: tomatoes, potatoes, eggs Action: needed for normal growth and development
B6 (pyridoxine)	Sources: fish, liver, potatoes Action: aids production of haemoglobin
B7 (biotin)	Sources: peanuts, bananas, liver Action: helps to make hormones
B9 (folic acid)	Sources: spinach, asparagus, yeast Action: critical to production of DNA
B12 (cobalamin)	Sources: eggs, fish, meat, dairy Action: critical to DNA synthesis, red blood cell formation