

THE ULTIMATE VITAMIN GUIDE

Which are worth taking... and which aren't

Are multivitamins

vital for good health – or a waste of money?

WE'RE a nation of vitamin pill poppers: around half of the UK population takes a supplement once a week or more. But which are worth buying, and which are just like flushing money down the drain? In this unique series, starting today and continuing tomorrow in The Mail on Sunday, we take a critical look at supplements – from single vitamins and herbal remedies, to 'superfood' powders to stir into smoothies – to give you the information you need to make up your own mind. Today we focus on multivitamins and minerals, and ask: is this what YOU need?

MANY people start their day by swallowing a multivitamin in the hope that this 'one-pill wonder' offers just the right amount of important nutrients to act as health insurance against illness.

These pack a wide range of nutrients into a convenient capsule and are one of the UK's favourite supplements. In 2022, 38 per cent of Britons took vitamins, minerals or supplements daily.

The official NHS line is that most of us can get all the nutrients we need by eating a healthy, balanced diet. The exceptions are vitamin D in the winter months (adults are advised to take 10mcg between October and March); vitamin B12 if you're a vegan (adults need 1.5mcg a day); and folic acid for women trying for a baby, to protect against birth defects.

THEN there is research, such as a review of 84 studies by the U.S. Preventive Services Task Force, published last year, which found little evidence to suggest supplements could help prevent heart disease or cancer, for instance.

The report stated that for otherwise healthy people, multivitamins are a waste of money. 'We should all [just] be following the evidence-based practices of eating healthily and exercising,' said the lead researcher, Dr Jeffrey Linder, head of general internal medicine at Northwestern University Feinberg School of Medicine. Yet

ULTIMATE VITAMIN GUIDE DAY ONE

the fact is that the recommended daily vitamin intakes are based on the level needed to prevent a deficiency in that nutrient, rather than the amount needed to achieve optimal health.

And while a good diet should – in theory – be able to protect you from deficiency symptoms (such as scurvy if you are lacking in vitamin C), very few of us are eating enough of the good stuff.

NHS studies show only 28 per

cent of UK adults eat five portions of fruit and veg a day – many struggle to meet that target in even a week – while an estimated 51 per cent of the UK diet is based on highly processed and nutritionally depleted foods, according to a study in the journal Public Health Nutrition.

Aidan Goggins, a pharmacist and an independent adviser to the supplement industry, says that even if we believe we are eating exemplary diets, they are in fact 'nowhere near as good as we think'.

He uses the term 'hidden hunger' to describe the effect of the declining amount of nutrients in plants over recent decades, as a result of intense farming.

This nutrient deficiency is compounded by the fact that we tend to eat such a narrow range of foods, he says. 'Of the 30,000 edible crops available to us, only 150 varieties are grown on a large scale and 95 per cent of

the world's calories come from just 30 plants,' he adds.

'Almost half of global calorie demand is supplied by three crops – maize, rice and wheat – and what little micronutrients [i.e. vitamins and minerals] there are in these grains are mostly lost in the intensive processing they undergo.'

'Overall, there is not a chance that our diets today provide sufficient nutrients even if we are "eating well",' he says.

There is further evidence, too, such as the analysis of official UK diet surveys in 2018 by public health nutritionist Emma Derbyshire. Published in the journal Frontiers in Nutrition, this showed that many women have lower than optimal levels of key nutrients, including B vitamins, magnesium, selenium, calcium, iron, potassium and iodine.

We're also not doing enough exercise: Sport England has found that most of us fall short of even the most basic NHS recommended activity targets.

Is it any wonder so many of us reach for a daily tablet or capsule just in case? Emma Derbyshire, who is also a spokesperson for the industry body, the Health and Food Supplements Information Service, believes supplements can play a role for some people.

'Studies show that supplements can help to boost vitamin and

mineral intakes, and that British adults who take supplements are more likely to meet nutrient recommendations than those who don't,' she says.

'But supplements should be seen as a means to top up the regular diet – not to replace the role of food.'

Margaret Rayman, a professor of nutritional medicine at the University of Surrey, agrees, saying that if you're one of the many whose vegetable repertoire is limited to peas and sweetcorn, who prefers white bread to brown, enjoys a drink (or two) and watches more sport on TV than you play, then 'a multivitamin might help replace some of what you are missing'.

She adds that topping up key nutrients to recommended levels is 'probably a good idea if you know your diet leaves a lot to be desired'.

Aidan Goggins isn't convinced about squeezing any number of vitamin and mineral compounds into a capsule, though. 'So many [multivitamins] contain a hotchpotch of junk – the wrong doses of nutrients, the wrong forms which offer poor

OUR FAVOURITE SUPPLEMENTS

THESE are the best-selling supplements in the UK in descending order.

1. Multivitamins/multiminerals
2. Fish oils and omega 3s
3. Vitamin D
4. Vitamin C
5. Iron
6. Vitamin combinations for women (ie menopause), men
7. Children's vitamins
8. Eye health
9. Energy



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absorption,' he says. 'That's why study outcomes for many supplements have been so terrible. For instance, research shows we absorb around 99 per cent of vitamin C taken as a single supplement but less than 50 per cent of it from a multivitamin.'

A major issue with multivitamins is the different compounds can compete with each other for absorption.

'You always get an element of trade-off with multivitamin supplements,' says Aidan Goggins.

'Fat-soluble vitamins such as A, D, E and K are better taken with other food — specifically fat — to aid absorption.

'Meanwhile, water-soluble vitamins such as Bs and C get absorbed in the small intestine, so they are actually best taken on an empty stomach, which allows the compounds to travel through the stomach unencumbered.'

But a key advantage of a broad-spectrum multivitamin is the fact that they rarely contain more than the minimum recommended levels of nutrients and, according to Professor Rayman, are unlikely to cause harm.

And if you do decide a multivitamin is for you, use this guide to help you.

EXPERT TIP

MULTIVITAMINS are generally best taken with a meal — ideally breakfast, says pharmacist Aidan Goggins, as there is a trade-off that some nutrients are better absorbed with fat, and others on an empty stomach. Taking them in the morning is better than the evening for another reason: B vitamins might stimulate metabolism and brain function, and then impair sleep.

SO WHO NEEDS A MULTIVITAMIN?

CHILDREN AGED 6 MONTHS-5: 'The NHS recommends pre-school children take vitamins A, C and D daily,' says public health nutritionist Emma Derbyshire, who is a spokesperson for the Health and Food Supplements Information Service.

'This is particularly important if they happen to be fatty eaters, as they might be missing out on important nutrients.'

TEENAGE GIRLS: Research shows that teenage girls can struggle to meet their nutritional needs through diet.

According to Emma Derbyshire, half of all girls fall below the recommended daily intake of iron and many can be short on B vitamins and magnesium, needed to support healthy skin and mood.

WOMEN WHO ARE PREGNANT/ TRYING FOR A BABY: Look for a 'planning to conceive' multivitamin formulated to top up important nutrients such as folic acid, says Emma Derbyshire. And during pregnancy, 'the baby gets first call on nutrients it needs from your diet, so make sure you're taking in enough nutrients to keep yourself healthy'.

WOMEN IN MENOPAUSE: A good diet will help the body adjust to hormonal changes, but a multivitamin can also be useful at this time, says Emma Derbyshire, who suggests a compound supplement formulated specifically for mid-life.

VEGANS: The NHS advises that people who eat a vegan diet take a vitamin B12 supplement. Emma Derbyshire says a multivitamin containing B12 is a good idea.

HOW and when you take your supplements can undo their potential benefits — here the experts explain how you should take your supplements to ensure you get the most out of them and don't waste your money...

IRON

NEEDED FOR: Making red blood cells, which carry oxygen around the body.

TOP LINE: Take on an empty stomach before bed; combine with vitamins A or C; avoid taking with dairy, tea or zinc pills.

'IRON should be taken on an empty stomach because certain foods can block its absorption,' says Aidan Goggins, a pharmacist and an independent adviser to the supplement industry.

'Vitamin C can help your body absorb iron, so it's a good idea to combine the two, either in a supplement or by having a glass of orange juice.' (Vitamin C bonds to iron particles, helping them dissolve better in the gut.)

Vitamin A can also improve iron absorption, so choose an iron supplement that contains it, or its precursor, beta-carotene.

Don't wash your pills down with milk-based drinks, as the calcium blocks iron receptors in the gut, impairing the absorption.

And avoid drinking tea when you take iron pills, as this can also inhibit the absorption of iron from your food by up to 90 per cent, adds Aidan Goggins — not just due to the dairy, but also because of the tannins (plant compounds) in tea, which can bind to iron.

'A 2017 study of UK women found that even drinking tea one hour after a meal reduced the amount of iron absorbed by 50 per cent — so leave at least two hours,' he says.

Zinc can also compete with iron because both minerals attach to the same 'transporters' that help nutrients get through the gut wall and into the bloodstream, so it's best to avoid products containing zinc.

'Because so many factors can interfere with iron absorption, it's best taken as a combined supplement with vitamin C, an hour before bed, but two hours after supper,' adds Aidan Goggins.

If taken right before bed it may linger in the gut and irritate it, triggering nausea and discomfort. Taking it an hour before bed means it should have passed into the stomach before you lie down.

CALCIUM

NEEDED FOR: Building bones and keeping teeth healthy; regulating muscle contractions, including your heartbeat; ensuring that blood clots normally.

TOP LINE: Take a pill featuring magnesium and vitamins D and K with breakfast; look for products containing calcium citrate; avoid taking with zinc or iron.

IDEALLY you want a pill that contains vitamin D and K as both boost the absorption of calcium.

'You need sufficient vitamin D in your blood to absorb calcium well,' says Aidan Goggins. Vitamin D is converted into the hormone calcitriol, which acts on cells in the gut to increase production of calcium-binding proteins called calbindins.

Magnesium is also needed for the absorption of vitamin D. 'It's a delicate relationship,' says Aidan Goggins. 'So a supplement containing all four nutrients is ideal.'

'Taking calcium with food will also enhance its absorption,' he says. And consider supplements with calcium citrate, 'which is

better absorbed by the gut than other cheaper forms of calcium, such as calcium carbonate'.

If you also use zinc or iron, take these separately as calcium inhibits their absorption.

VITAMIN D

NEEDED FOR: Regulating calcium and phosphate in the body, which keep bones, teeth and muscles healthy; supporting immunity.

TOP LINE: Take in the evening (or with your largest meal of the day) with fat-containing food; avoid taking with vitamin E.

LIKE other fat-soluble vitamins (A, E and K), vitamin D is better absorbed if taken with a meal that contains fat, such as avocado, egg yolks or olive oil.

A study in the Journal of Bone and Mineral Research in 2010 found that taking it with your evening meal — usually the heaviest meal of the day — increased blood levels of the vitamin by up to 50 per cent compared with taking it on an empty stomach or with a smaller meal.

'Taking vitamin D with food ensures the optimal release of bile and pancreatic enzymes required for the absorption

of fat-soluble vitamins,' says Aidan Goggins.

But don't take vitamin D with vitamin E because they're absorbed through the same mechanism and so compete, reducing the amount of both that's absorbed.

B VITAMINS

NEEDED FOR: Keeping the nervous system healthy and releasing energy from food.

TOP LINE: Take in the morning on an empty stomach. BECAUSE of their energy-boosting abilities and the fact that they are water-soluble, B vitamins are best taken first thing on an empty stomach.

Vitamin B12, in particular, binds to the protein in food and can end up passing straight out of the gut as waste without being absorbed.

VITAMIN C
NEEDED FOR: Maintaining healthy skin, blood vessels, bones and cartilage; wound healing.

TOP LINE: Take in the morning on an empty stomach; split larger doses throughout the day; consider 'fat-wrapped' pills. LIKE most water-soluble vitamins, vitamin C is best absorbed on an empty stomach, such as before breakfast, as its absorption can be hindered by proteins and fibre in food.

Studies suggest we can absorb doses of up to 400mg, but any excess is simply passed out in urine. So if you're taking short-term, large doses of 1,000mg, say, you may be better splitting up the dose throughout the day to maintain constant high levels in the blood. Aidan Goggins says a split dose can also prevent any stomach upset associated with these larger doses.

A new generation of liposome-encapsulated vitamin C products — which wrap vitamin C particles in protective fat bubbles — may mean you absorb more than with standard oral vitamin C supplements.

But Lindsay Kass, a sports and nutrition scientist at the

University of Hertfordshire, says that while this approach does work, 'a standard supplement will give you more than enough vitamin C'.

FISH OILS

NEEDED FOR: Supporting heart and brain health; tackling inflammation.

TOP LINE: Take with food that contains fat; avoid taking before a workout or just before sleep.

TIMING really is key here: 'Don't take fish oils in the morning before you've eaten,' says Aidan Goggins. 'They need dietary fat to help their absorption so should always be taken with a meal.'

'That's because fat triggers the pancreas to release enzymes that help break down omega-3 oils into fragments small enough to be absorbed through the gut wall.'

And avoid taking them before

Why

TIMING is key to getting the most out of your PILLS



ME AND MY VITS
COMEDIAN Barry Humphries, 89: 'I take fish oil tablets because I was told they were good for the brain.'
As told to Good Health, February 2022

AT A GLANCE: YOUR PILL CLOCK

- A **ROUGH** guide to optimum times to take supplements.
- BEFORE BREAKFAST:** B complex vitamins, vitamin C
- WITH BREAKFAST:** calcium
- 30 MINUTES BEFORE A MEAL:** probiotics
- WITH EVENING MEAL:** vitamin D, fish oils
- AN HOUR BEFORE BED:** iron
- AT BEDTIME:** magnesium

a workout or sleep as digesting the supplement will produce gas in your stomach, says Aidan Goggins, 'and strenuous activity or lying down encourages this to travel up the oesophagus, triggering reflux — or unpleasant fishy burps'.

If you find it difficult to digest fish oils, consider a supplement with the enzyme lipase, which boosts fat digestion.

PROBIOTICS
NEEDED FOR: Boosting 'good' gut microbes.

TOP LINE: Take half an hour before a meal containing fat; avoid taking with hot drinks, juices or alcohol.

to reach the gut intact to have any benefit, says Aidan Goggins. 'So avoid taking these delicate bugs with anything that might destroy them.'

'Hot drinks can kill them, as can the acid levels in fruit juice and alcohol, so take them with plain water,' he adds. 'Water helps dilute stomach acid, which further increases their survival chances.'

Consider taking them before eating. A 2011 study in Canada found that probiotics containing the bacteria *Lactobacillus* and *Bifidobacterium* had the highest survival rate when taken 30 minutes before a meal. It also helped if the subsequent meal contained some fat — probably as this reduced stomach acidity.

'Taking probiotics half an hour after food had the opposite effect,

with the lowest bacteria survival rate (probably as this is when stomach acid is at its highest level).

MAGNESIUM

NEEDED FOR: Turning food into energy; ensuring the parathyroid gland, which produces hormones key to bone health, works normally.

TOP LINE: Balance carefully if combining with calcium; take at bedtime for a relaxing effect.

THERE is evidence that magnesium may help ease anxiety, restless legs and migraine, and improve sleep. But because calcium and magnesium can compete for absorption, if you're taking both, check the ratio — you need roughly twice as much calcium as magnesium (otherwise magnesium absorption will be affected).

If you're taking magnesium on its own, its relaxing effect means it makes sense to take it close to bedtime and consider trying it as a lotion or cream.

One 2017 study found that applying a magnesium cream to the skin daily for two weeks improved blood levels of the mineral by more than 22 per cent — more than double the amount you'd receive from a magnesium tablet.

6 REASONS YOU MAY BE LACKING IN VITAMINS

WE'RE often told that the best source of vitamins and minerals is a healthy diet. But the following scenarios can affect our ability to reap the benefits of those dietary nutrients and might be reasons to consider taking a supplement (with your doctor's advice, where appropriate).

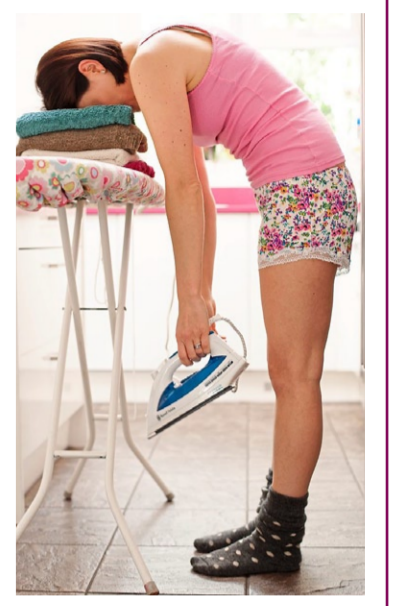
YOU TAKE REGULAR PRESCRIPTION MEDICINE: Certain medications — such as diabetes drug metformin, steroids, painkillers, acid reflux pills or oral contraceptives — are known to interfere with the body's absorption of particular vitamins and minerals or cause them to be excreted too quickly.

YOU'RE OVER 60 OR A VEGAN: If you also suffer from symptoms such as mouth ulcers, fatigue, pins and needles, low mood and irritability, you could be lacking vitamin B12.

As we age, we don't produce as much of the stomach acid and enzymes that help release B12 from food — good sources include meat and dairy products.

YOU DRINK A LOT OF COFFEE: Caffeine (also found in tea) is a diuretic, and that means water-soluble vitamins, such as B vitamins and vitamin C, can be excreted before you fully absorb them.

YOU'RE THINKING OF HAVING A BABY: Women who have had low nutrient intake for many years — perhaps because of restricted eating habits — will



usually need to take supplements in the short term to get their bodies ready for conception, some experts advise.

YOU'RE IN YOUR 40s OR 50s AND DON'T EAT OILY FISH: Higher levels of omega-3s in the blood are linked to better brain function and preserve brain health, researchers say.

Ensuring you get enough in mid-life could lessen your long-term risk of getting dementia.

YOU HAVE AN ENLARGED PROSTATE: Men who have been diagnosed with benign prostatic hyperplasia could benefit from taking specific supplements, such as saw palmetto.

You'll find more information on these supplements in the pullouts in tomorrow's The Mail on Sunday and Monday's Daily Mail.

DON'T SWIG THEM DOWN WITH A CUPPA!

ALWAYS swallow supplements with a big glass of water: fluid intake is important to ensure that they are washed into your stomach and small intestine. It also ensures that water-soluble nutrients, such as B vitamins and vitamin C, are dissolved and fully ready for absorption when they do arrive there.

But skip the coffee, tea or energy drinks with caffeine, as caffeine can interfere with the absorption of nutrients. It is also a diuretic, meaning you could excrete the water-soluble vitamins before your body can absorb them.

It's best to wait for an hour after drinking

coffee before taking supplements, too.

And don't eat nuts just before taking minerals. Phytic acid — a form of phosphorus found in plant-based foods, such as bran, beans and nuts — binds to minerals in the gut, including iron, calcium and magnesium, creating phytates.

Our bodies can't break down phytates, meaning that any minerals bound to them won't be absorbed well.

But studies show this only affects the absorption of nutrients eaten at the same meal, so eating nuts a few hours later is fine.



ULTIMATE VITAMIN GUIDE

FACED with a bewildering range of different supplement formulations — tablet, spray, gummy, fizzy — which one should you choose?

Cost may be a guide: multivitamins can vary enormously in price from just £3 for a month's supply to £20.

Yet as Margaret Rayman, a professor of nutritional medicine at the University of Surrey, says: 'It would be wrong to assume that just because you're paying more, you are getting a better product.'

The cheapest safe format is a supermarket or chemist own-brand tablet. Other formats (dissolvables, sprays, gummies) are usually more expensive. For instance, Centrum MultiGummies are 25p each, compared with 17p for a Centrum tablet.

So which formulation is best for you? (To find out if premium brands are worth the added cost, read tomorrow's pullout in The Mail on Sunday.)

TABLETS

THESE have a longer shelf life than liquids or gummies, but are not always suitable for delivering large doses, which might make them harder to swallow. However, supplement tablets can be halved if a smaller dose is required.

CAPSULES

USUALLY capsules have a gelatine case, which breaks down while passing through the gut, meaning their contents are absorbed more swiftly. They're easier to swallow than tablets, and some (such as probiotics) have cases formulated to withstand stomach acid so that they release their contents lower down the digestive tract.

SPRAYS

THESE ensure the nutrient is absorbed quickly into the bloodstream and are convenient for children and the elderly who find swallowing tablets difficult.

Sprays also avoid potential absorption problems if you have gut conditions such as irritable bowel syndrome (IBS). But you might have to pay a premium for what should be a cheap nutrient, says Professor Rayman.

GUMMIES

THESE look and taste like sweets. 'Gummies might be good

Tablet, spray or gummy...what's best for YOUR needs?



HERE are some tips to help you choose a liquid vitamin:

■ **CHECK FOR ADDED FAT:** With fat-soluble vitamins, such as vitamin D or E, look for formulations with added fats such as coconut oil. These will help your body absorb the vitamins fully.

■ **WATCH SUGAR LEVELS:** One downside of liquid supplements is that they can contain lots of sugar to make them taste more pleasant. Check the label. Ideally a product should contain less than 2.5mg of sugar per 100ml to be considered low in sugar.

■ **MEASURE OUT YOUR DOSE:** When taking liquid vitamins, read the exact dosage on the bottle. Do not be tempted to just take a swig. Overdosing on some vitamins, such as vitamin A or iron, can have grave side-effects, warns Aidan Goggins.

Use the measuring cap, syringe or spoon provided, he adds. 'People make dosing errors ranging from confusion with the units, to whether to use a teaspoon or tablespoon.'

■ **STORE IT RIGHT:** Many liquid supplements have a shorter shelf life than other forms. Their water content makes them less stable, plus air exposure each time the lid comes off can further degrade nutrients. Most need to be refrigerated after opening.

THESE are some nutrients that experts suggest are better in liquid form:

OMEGA 3s: Due to the large amount needed for a useful dose of the EPA and DHA fatty acids they contain, omega-3 supplements usually come in a large capsule. Taking fish oil in liquid form may be more palatable, says Aidan Goggins.

IRON: 'There's evidence that liquid iron may be easier to absorb than tablets,' says Lindsay Kass, a sports and nutrition scientist at the University of Hertfordshire.

'And iron gluconate [a salt] is better than the iron ferrous salts that most supplements contain, which are harder to absorb and can cause stomach irritation.'

MAGNESIUM: Most tablets contain magnesium oxide as it's cheap. But your body struggles to absorb much of it, says Aidan Goggins. 'Taking a liquid formula which contains magnesium chloride will maximise how much you absorb. It's also less likely to cause diarrhoea.'

AND one you probably don't need to take in liquid form:

VITAMIN C: This nutrient 'becomes unstable in a liquid formulation', says Lindsay Kass, so your dose will become lower each time the bottle is opened. Powder or tablet forms are more stable.

COMPILED BY: LOUISE ATKINSON and Caroline Jones

NOTE: Consult your GP or pharmacist before taking vitamins or supplements, particularly if taking any prescribed medication, in case of contraindications.

ME AND MY VITS

DRUMMER and Strictly champion Harry Judd, 37: 'I take multivitamins and a plant-based protein powder to boost immunity.'

As told to Good Health, September 2022



for children who can't swallow tablets but they're not great for adults,' says pharmacist Aidan Goggins. 'You might as well buy a pack of wine gums and

a low-cost supplement. It's all about context,' he says. 'If a child won't take tablets, getting nutrients in through gummies is better than not getting them at all.'

'But when you grow up that's not a justifiable compromise as most of the ingredient space is used for the gummy — so you can only fit in low doses of the nutrient. Frankly, you have to ask:

'Is this more confectionery than nutrition?' Psychologically, we should be affirming that supplements are a serious subject, not an alternative to Haribo.'

FIZZY TABLETS

FIZZY tablet versions of vitamins are popular. They are claimed to be easier on the stomach and more rapidly absorbed (as the compound is already dissolved when you drink it).

This is particularly true for magnesium oxide, says Aidan Goggins. It means you get more of the active ingredient in a lower dose and fewer risks of side-effects such as diarrhoea.

LIQUID VITAMINS

MANY supplements, from iron to vitamin C and calcium, come in liquid form — and taking them in this way could be better for you.

On swallowing a vitamin pill, your body enters a race against time to break down the casing of capsules, or the hard glue of tablets, in order to access the nutrients.

'Conventional tablets are dissolved more slowly, which can mean absorption is reduced,' says Aidan Goggins.

'If they haven't completely broken down by the time they reach the small intestine, some of the nutrient will pass out as waste before it can be absorbed into the bloodstream.'

'Liquid forms, though, are already dissolved and so will often be absorbed faster and more completely,' he explains.

'Liquid also allows for larger doses and is easier to swallow, so it is invaluable for those who have a problem swallowing tablets.'

However, liquid supplements can cost three times as much.

HOW TO CHOOSE A MULTIVITAMIN

LOOK for a multivitamin and mineral supplement that contains vitamin D (ideally 10mcg); 30-50mcg selenium; 140mcg iodine; vitamin B12; and iron, as these are the nutrients we are most likely to be deficient in, says Margaret Rayman, professor of nutritional medicine at the University of Surrey.

READ THE LABEL: No two multivitamins will contain the same combination of nutrients, so it is a good idea to read the label to check the contents — it could just as easily contain three or four key vitamins or 20 or more compounds.

The ingredients used can also vary — there are both natural and synthetic sources, and some options are more bioavailable or easier for the body to absorb (more on this in tomorrow's

pullout in The Mail on Sunday). All multivitamins will also include excipients, the inactive compounds that stabilise the active ingredients (so they don't go off), and fillers which help to create the shape and form of the pill or gummy.

Look out for lactose and artificial sweeteners which can cause tummy upsets in some people.

MATCH YOUR AGE: Public health nutritionist Emma Derbyshire recommends choosing a multivitamin formulated for your stage of life (e.g. children, pregnancy or over-50s) which contain different doses of each nutrient.

'Children require lower doses of vitamins, for instance, and in pregnancy you'll need higher folic acid and lower vitamin A,' she says.

So which vitamins should your child be taking? Find out here:



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IN TOMORROW'S

SCOTTISH
The Mail
ON SUNDAY

From sleep to heart health, supplements recommended by leading experts

THE ULTIMATE VITAMIN GUIDE

DAY TWO

ESSENTIAL PULLOUT THAT COULD TRANSFORM YOUR HEALTH

IN THE first segment of a major three-part series, yesterday's Daily Mail took a critical look at multivitamins. Here we focus on the nutrients that our bodies use when dealing with specific conditions, and whether taking certain supplements might give them a helpful boost.

EVIDENCE-BASED is the gold standard in medicine for any treatment or advice – it means there is good research supporting its use. And, increasingly, the medical world is investigating whether the same is true for the role of diet in our health.

For example, there is a plethora of studies looking at treating conditions with probiotics. Also called good bacteria, they are being studied as a way of improving cancer patients' response to chemotherapy.

And after long being told that we should obtain everything we need from a healthy diet and lifestyle, it seems that there may be a role for supplements after all.

However, as extracts from nutrient-rich apples or broccoli cannot be patented and sold for millions like a new drug, research money is more likely to be invested in medical treatments rather than supplements.

'Because many natural extracts are not patentable, the product cannot be protected, so any big company seeking to put money behind research can't guarantee a financial return,' explains nutritionist Dr Adam Carey, a former consultant in obstetrics and gynaecology. 'The result is lots of small studies, which are not well funded.'

What has followed is an understandable wariness among medical professionals about the usefulness of vitamins, minerals, herbs and food extracts. This has been compounded by the lower levels of protective legislation for supplements compared to drugs.

Supplements and herbs are not considered significant enough to be prescribed or recommended. Yet many do have metabolic actions powerful enough that your GP would warn you against taking some in conjunction with prescription medicine.

For instance, Vitamins E and K can interfere with the action of the blood-thinning drug warfarin, while calcium supplements can reduce the effect of some antibiotics. But, increasingly, health professionals are looking closely at the role of supplements.

Angus Dalgleish, a professor of oncology at St George's Hospital in London, is a clinician investigating the role of Vitamin D in cancer treatment on the basis that it helps regulate the immune system and 'seems to dampen the proliferation of cancer cells'.

Dr Carey, who left the NHS after



What supplements DO work...and which are best for YOU?

30 years to focus on using nutrition to help athletes, says: 'As a conventionally trained medic, I was told everyone could get all the nutrients they need from a well-balanced healthy diet. But I couldn't understand how, if that was the case, we insist pregnant women take a folic acid supplement. There isn't enough in the diet to protect their unborn baby from neural tube defects. I have been working in this field for more than 20 years and rarely met anyone who has

managed to achieve this goal of getting everything they need from a healthy, well-balanced diet.'

And, as we reveal here, when it comes to certain conditions, those gaps may be relevant when it comes to treatment.

IMMUNITY COULD BE HELPFUL:

Vitamins A and D; omega-3; zinc; quercetin; selenium
Dr Jenna Macciocchi is an immunologist and senior lecturer at the

University of Sussex and author of *Your Blueprint For Strong Immunity*. While she advocates a 'food-first' approach to health and immunity support, she says: 'Unfortunately, it seems we are heading towards a situation where some individuals – those eating modern diets – may find it not possible to meet their nutrient needs through food alone.'

'Food should absolutely be the foundation. Then we should supple-

ment smartly to help close any gaps. The word "supplement" reflects that we are supplementing a healthy diet.'

When it comes to reducing respiratory infections such as colds and flu, 'Vitamins D and A take centre stage', she says.

Approximately one in five people have Vitamin D levels low enough to reduce the effectiveness of their immune defences, and about four out of five people are deficient in Vitamin D by winter – the sun is not strong enough here between October and April.

Low intake of omega-3, which we get from nuts, seeds and oily fish, is also an issue. Dr Macciocchi explains that healthy omega-3 fats, specifically EPA and DHA, can inactivate viruses by making our cell conditions less favourable for them to replicate.

'In the UK, only a quarter of us are oily fish consumers and just

Don't like fish? Take fish oil!

FISH oil contains EPA and DHA, two forms of omega-3 unsaturated fats which have a number of positive effects on the body but can also help to ease pain.

'There is strong research to show that, in high doses, fish oils can modify inflammation, which can be beneficial for people with heart disease or inflammatory diseases such as rheumatoid arthritis,' says Aidan Goggins, a pharmacist and independent

adviser to the supplement industry. However, the benefits are seen only with far higher doses of EPA and DHA than you'd find in a low-cost supplement.

'If you're healthy, but don't eat fish, you might benefit from inexpensive omega-3 with 300mg to 500mg of EPA or DHA per day,' he says. 'But if you have a specific health condition, such as rheumatoid arthritis, you might want to take 2g to 4g per day.'

Higher-dose supplements tend to cost more.

Professor Margaret Rayman, head of nutritional science at the University of Surrey, uses high-dose omega-3 for her rheumatoid arthritis. She is convinced by studies that show omega-3s, particularly EPA, can help inflammation and joint pain.



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7.3 per cent of children get enough through their diets. You could make an argument for taking a daily omega-3 supplement if you're not eating two portions of oily fish a week, or have an inflammatory condition.

Omega-3 helps reduce inflammation by interfering with the production of pro-inflammatory molecules (prostaglandins and leukotrienes) and acting as the raw materials for the production of anti-inflammatory molecules. If you do not eat oily fish, the British Dietetic Association suggests adults choose a supplement that provides about 450mg EPA and DHA per day.

Dr Macciocchi recommends having a 'little medicine box' of supplements to reach for at the first onset of symptoms of any respiratory virus, such as a cold or flu. She says they might help support the additional demands on your body, and perhaps shorten the duration of symptoms. She suggests:

● **Vitamin C and citrus bioflavonoids** (compounds from citrus fruits, taken as a pill or powder). When fighting an infection, your immune system uses far more Vitamin C. Citrus bioflavonoids, also known as flavonoids or Vitamin P, are a group of plant pigments found in oranges, lemons and grapefruits. These can help increase the benefits of Vitamin C in several ways, including enhancing absorption.

● **Zinc and zinc ionophores** (an easier-to-absorb version of zinc). Supplements are unlikely to reduce your chances of getting a cold unless you are at risk of deficiency, says Dr Macciocchi.

But taking small doses of zinc two or three times a day, such as by sucking zinc lozenges with a total daily dose of 10mg to 40mg, has been shown to substantially reduce the duration of common colds. Higher doses can cause side effects including nausea, diarrhoea and vomiting; ingestion of more than 1,000mg in a single dose, or long-term supplementation, with more than 100mg daily, can cause copper and iron deficiency, says Dr Macciocchi.

● **Quercetin**. Taking this plant compound with a zinc supplement helps get the zinc inside your cells. It has its own antiviral properties, too, says Dr Macciocchi.

● **Selenium**. Found in seafood and Brazil nuts, this helps stop invading pathogens mutating and infecting. It has antioxidant properties, supports the production of more immune cells and helps maintain optimal immune function, so a supplement may be useful if you're not getting enough in your diet.

It also helps when you're older (we tend to absorb less from our diet as we age) or have multiple medical conditions and are at high risk from infection. Look for selenomethionine, which is the most easily absorbed form.

EYE SIGHT

COULD BE HELPFUL: Omega-3 and -6 or flaxseed oils; Vitamins C and E; copper; zinc; zeaxanthin; beta carotene or lutein

Badrul Hussain, a consultant ophthalmic surgeon at Moorfields Eye Hospital in London, says: 'My answer [for eye health] is usually to stop smoking, to eat a rainbow [a very wide variety of colourful fruit and vegetables] and to get plenty of exercise.'

But people diagnosed with dry eye syndrome, a common issue with age caused by problems with the oil-producing glands, might benefit from taking omega-3 and -6 oils or flaxseed oils. 'Although the evidence is weak, we know these oils can sometimes help,' he says.

However, there is one very specific subset of patients who certainly benefit from taking supplements: those with age-related macular degeneration (AMD) at an intermediate state.

'Robust, published studies have shown that a specific formulation of dietary supplements, if taken by

COMMON COLD

A LARGE number of clinical studies provide evidence that high-quality supplements of the echinacea plant both prevent and treat the common cold by reducing the symptoms and their duration.

Michael Heinrich, a professor of ethnopharmacology and pharmacognosy at University College London, 'strongly recommends' checking a product carries the Traditional Herbal Registration (THR) mark, which means that it complies with Government standards.

people when they are at the intermediate stage, can slow the progression of the disease by 25 per cent,' Dr Hussain says.

'Macular degeneration is a progressive disease. It can take one or two years for sight to degenerate to an advanced state. It is useful to take a supplement which has been shown to slow progression.'

The nutrient cocktail includes Vitamin C (500mg), Vitamin E (268mg), copper (2mg), zinc (80mg), beta carotene (15mg) or lutein (10mg) and zeaxanthin (2mg).

These nutrients can be bought separately or in combination as branded macular degeneration protective supplements.

However, Dr Hussain warns that anyone who smokes, or who has smoked at some point in their life, should avoid taking any supplements containing beta carotene, as high intakes – as provided by some products – may increase the risk of lung cancer.

Over 50? Get your bounce back

VITAMIN B12, found in meat, fish, eggs and dairy products, helps the body make red blood cells and release energy from food. A lack of it can lead to fatigue, lethargy and physical symptoms of feeling run down, such as mouth ulcers.

As we age, changes in our digestion – including producing less stomach acid – reduce our

Can vitamins give your heart a boost... or is it all in the mind?



SLEEP PROBLEMS COULD BE HELPFUL:

Magnesium; B vitamins; omega-3; Vitamin D; tryptophan; valerian root; chamomile; 5-HTP; cherry extract; saffron

Many people would rather use supplements and not prescribed medications to try to get better sleep. But will they make a difference?

Dr Zoe Gotts, a consultant clinical psychologist who works for the NHS, suggests the evidence for their effectiveness and safety is limited. She also says they certainly shouldn't be used for chronic insomnia (defined as difficulty falling or staying asleep for three or more nights a week for at least three months).

She believes you should be able to get these nutrients from your diet – but Aidan Goggins, a pharmacist and an independent adviser to the supplement industry, says that some people will not be able to do so. There are also herbal remedies, such as valerian root (from a plant found in Europe and Asia).

Dr Richard Middleton, a pharmacist and director of the British Herbal Medicine Association, says there are many herbs that relieve insomnia caused by anxiety. 'Herbs seem to work on the central nervous system by influencing the various neurotransmitters that affect stress and anxiety,' he says. 'They seem to have a more gentle action than prescribed medicines.'

He warns that herbal remedies may not work as quickly as conventional medicines and that they should be taken regularly for a few weeks to obtain maximum benefit. 'Herbal remedies should not be taken at the same time as other prescribed or over-the-counter medicines, and excessive use of alcohol should be avoided,' he adds.

Here we look at the nutrients and herbal remedies that may help with sleep:

● **MAGNESIUM:** Dr Gotts says: 'This mineral helps raise dopamine levels – a chemical messenger in the brain linked to mood – and maintain levels of Gamma-Aminobutyric acid (GABA), another chemical messenger. This boosts feelings of relaxation and calm. 'By aiding relaxation, magnesium

may help with promoting sleep.' Dr Middleton adds: 'Some studies have shown magnesium supplements improve not only the length of time we sleep, but also decrease the time it takes to fall asleep.'

However, Dr Gotts says we should get adequate intake from our diet, from foods such as almonds, spinach and yogurt. Goggins says: 'UK research shows not one age group on average consumes the recommended intake of magnesium. It is only worsening, with 20 per cent of adults in their 20s not even reaching the minimum nutrient intake to prevent deficiency.'

While studies point towards magnesium having a positive impact on sleep, more data is needed to make any conclusive assumptions about it as a supplement.

● **B VITAMINS:** These play a key role in production of the hormone melatonin, which regulates the sleep cycle. There is some evidence that taking a supplement can help, but it may be better to avoid taking it just before going to bed as it could keep you awake.

● **TRYPTOPHAN:** A diet high in this amino acid has been linked with better quality of sleep, says Dr Gotts. 'The body uses tryptophan to produce serotonin which, in turn, helps to regulate sleep. But we cannot produce tryptophan.'

It is found in sunflower, sesame and pumpkin seeds. Poultry, beans and oats are also good sources.

● **VALERIAN ROOT:** A review of 12 studies involving more than 1,000 patients published in the American Journal Of Medicine showed this herbal extract can 'improve sleep quality without side effects'. One way it may do this is by acting on receptors, which can ease anxiety.

Dr Gotts suggests valerian tea can be made by soaking two to three grams of dried herbal valerian root (available from health food stores) in a cup of hot water for ten minutes. However, she warns that it should be avoided by those taking sedatives or medications for anxiety.

● **5-HTP:** 'The amino acid hydroxytryptophan (5-HTP) is involved in the production of the sleep hormone melatonin,' says Dr Middleton. 'Studies have shown it could help improve sleep quality in people who wake frequently at night.'

One small study found that those taking a daily dose of 100mg for up to eight weeks went to sleep faster and slept more deeply than those

taking a placebo – but this did not last past the 12 weeks' treatment.

● **CHERRY EXTRACT:** Juice from a sour variety of cherry called Montmorency has been shown to help boost melatonin production thanks to a naturally occurring antioxidant named phenolic acid, which has blood-pressure-lowering qualities.

Also, Aidan Goggins points out that studies have shown having a tart cherry product before bed increases sleep time by about 30 minutes. The benefits appear to be down to its rich content of procyandin-B2, which prevents the breakdown of tryptophan in the brain and improves sleep quality.

Tart cherries boast 40 times the levels of procyandin-B2 of normal cherries and contain minor amounts of the melatonin.

● **SAFFRON:** Harvested from crocus flowers, this has been used for more than 4,000 years as a medicine. Today, science supports

it as a treatment for depression, anxiety and sleep, and improving your mood upon awakening. The standard dose in a capsule is 28mg, taken in the evenings, though recent research suggests it helps at half of this dose.

● **HOW TO TAKE YOUR CALCIUM PILL:** There are many formulations of calcium supplements that affect the elemental calcium – the actual amount of calcium – in each tablet. For instance, 1,250mg of calcium carbonate provides 500mg of calcium. Ms Leyland recommends checking the label for terms such as 'equivalent to' or 'provides' to calculate your daily intake.

● Calcium supplements are best taken after meals when digestive juices are stimulated to aid its absorption, says Ms Leyland.

● Ask your pharmacist to check contraindications – signs that you should not continue with a particular medicine or treatment such as iron tablets and thyroxine, which can reduce absorption, and allow a few hours between taking these drugs and the supplements.

● Don't overdo the dose, as more than 2,500mg of calcium a day on a regular basis could lead to kidney stones and interfere with the absorption of iron and magnesium from the diet.

● If you're taking osteoporosis medication such as bisphosphonates, do not take your calcium supplements at the same time as calcium can block its absorption.

● The most common calcium supplement is calcium carbonate, but if this causes gastric problems, such as nausea, constipation or diarrhoea, try calcium citrate, which can be more easily absorbed, especially by older people.

DEMENTIA PREVENTION

A MULTIVITAMIN can help prevent cognitive decline in people over the age of 65, keeping the brain sharp for an extra two years, according to a study published last year in the journal *Alzheimer's & Dementia*.

The analysis of 2,200 men and women found that those who took the dietary supplement every day slowed their ageing by 60 per cent, or 1.8 years, with improved memory, focus

and thinking. The multivitamins they took contained Vitamins A, B, C, D, E and K, minerals such as zinc, selenium and magnesium, as well as a couple of antioxidants. The scientists behind the study believe one reason for the results is that our ability to absorb nutrients – from food or elsewhere – diminishes with age.

Medication is more likely to affect this in older age, too.

● **FLAVONOIDS:** 'Its effects may be due to the flavonoid [plant ingredient] apigenin, which binds to receptors to reduce brain activity.'

Both supplements and tea bags contain apigenin, which is 'chemically stable' and will survive having boiling water poured over it, he says – adding that the amount in any tea or supplement will vary between brands. If you're drinking the tea, Dr Middleton recommends it in the early evening and again half an hour before bed.

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HEART HEALTH COULD BE HELPFUL:

Coenzyme Q10; magnesium; omega-3; garlic

DR AMEET BAKHAI, a consultant cardiologist and research director at the Royal Free Hospital in North London, says certain supplements 'have been shown to have some symptom and blood pressure-reducing benefits'. However, he adds: 'The evidence is still at an early stage and some of the benefits could be down to placebo effect.'

● **Coenzyme Q10:** Dr Bakhai says that supplements of this antioxidant (also known as ubiquinone) can have a positive effect on heart symptoms, 'especially those who experience muscle aches when they are on statins or those patients with weakened hearts'.

A comprehensive review of studies published in 2018 in the journal *Current Cardiology Reviews* found doses of 100mg to 300mg a day to be useful.

● **Magnesium:** 'A supplement of magnesium is also sometimes recommended, as it appears to help some patients with heart-rhythm problems to reduce the number of extra beats and to slightly lower blood pressure,' says Dr Bakhai.

● **Omega-3:** These can be useful for lowering triglycerides (blood fats) which are bad for the heart. A large study published in the *British Medical Journal*, which involved the data of more than 22,000 men and women aged 39 to 79 for an average of 19 years, found a 26 per cent lower risk of dying from coronary heart disease among those taking omega-3 supplements compared with those who didn't take supplements.

● **Garlic:** Supplements, raw garlic, garlic powder, garlic extracts and garlic oil have all been shown to help improve blood pressure.

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● The most common calcium supplement is calcium carbonate, but if this causes gastric problems, such as nausea, constipation or diarrhoea, try calcium citrate, which can be more easily absorbed, especially by older people.

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Prostate relief that can stave off surgery

PROSTATE

HALF of men aged over 50 have an enlarged prostate (benign prostatic hyperplasia, or BPH). Research suggests that cheap supplements could help ease the symptoms, such as frequently wanting to urinate yet struggling to do so.

Prescription medication can ease these symptoms but some men suffer side effects. Each year about 12,000 men undergo surgery to treat enlarged prostates.

SAW PALMETTO:

Derived from a tree native to North America, saw palmetto (roughly 17p per tablet) 'can definitely help men who have swollen prostates,' says Marc Laniado, a consultant urological surgeon at The Princess Grace Hospital in London. While there's no recommended dose, research involved taking 300mg to 900mg a day.

Mr Laniado adds: 'Many [medications] come in powdered form, which rarely works as well as tablets made from hexane [a chemical derived from crude oil] to extract more of the active ingredients.'

BETA-SITOSTEROL:

Some studies suggest that this cholesterol-like substance that derives from South African star grass can significantly increase urinary flow in men

with swollen prostates. Others, though, have found little benefit. Costing about £13.75 for 90 tablets (standard dose is 60mg to 130mg a day), a review by the authoritative Cochrane Centre concluded: 'They may be useful for men who would like to avoid the adverse effects of medicines or surgery.'

● **LYCOPENE:** The antioxidant, abundant in cooked tomatoes, has been shown in animal and



lab studies to inhibit the growth of prostate cancer cells. While the US National Cancer Institute warns that human trials (using about 40mg a day) have failed to demonstrate the same level of consistency, Mr Laniado says: 'There is some evidence that taking lycopene reduces inflammation in the prostate and lowers levels of prostate-specific antigen [PSA].'

The PSA protein can increase in the body when prostate cancer cells are present.

getting enough calcium from your diet, try using an online calculator (<https://webapps.igc.ed.ac.uk/world/research/rheumatological/calcium-calculator/>).

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What to take to reduce the side effects of your prescription medicines

COMMON prescription drugs can deprive the body of vital minerals and vitamins, leading to symptoms such as fatigue, hair loss, muscle pain and loss of sex drive.

'GPs and pharmacists should be aware of this when prescribing,' says Anja St Clair Jones, a consultant pharmacist at University Hospitals Sussex NHS Foundation Trust. So while it is vital to keep taking prescribed medication, here we look how to address any of the effects they might have on your nutrient levels.

HEARTBURN TABLETS IN THE SPOTLIGHT:

Iron; calcium; magnesium; Vitamins B12 and C

PROTON pump inhibitors (PPIs) such as omeprazole are taken by millions to reduce levels of stomach acid, relieve heartburn and prevent stomach ulcers.

Iron, calcium and magnesium, Vitamins B12 and C 'need an acidic environment to be absorbed in the stomach, and PPIs reduce acid production, so you can get absorption problems,' explains St Clair Jones. 'It's particularly severe in the elderly - who tend to have absorption problems anyway - and in those who don't eat a wide enough range of foods.'

Long term, a lack of calcium can lead to osteoporosis while low magnesium can lead to muscle cramps and loss of appetite.

Low iron levels are 'a big problem', says St Clair Jones, 'and medication side effects are a factor in this'.

Symptoms of iron deficiency anaemia include tiredness and fatigue, breathlessness, restless legs and hair loss. She adds: 'The risk of a deficiency in iron or vitamins increases the longer you are on PPIs, so check with your pharmacist or GP to see if it is still necessary to take them.'

CONTRACEPTIVES IN THE SPOTLIGHT:

Folic acid; Vitamins B2, B6, B12, C and E; magnesium; selenium and zinc

WOMEN taking the Pill can lack key nutrients, specifically folic acid, Vitamins B2, B6, B12, C and E, as well as the minerals magnesium, selenium and zinc.

According to a 2014 study published in the European Review For Medical And Pharmacological Sciences, 'the possibility of preventing vitamin and mineral deficiency through the intake of dietary supplements should be considered as a first-line approach'.

Vitamin B6 is involved in regulating mood. Last year a study of students on the Pill, reported in the Journal Of Dietary Supplements, found that those who also



took 100mg of the vitamin each day for eight weeks reduced their score on a depression chart by 20 per cent, while those given a placebo increased their scores by 11 per cent.

Meanwhile, a study in the journal Plos One in 2016, based on 39,000 women on the Pill, suggested that vitamin and mineral deficiencies may be to blame for their increased risk of obesity.

HEART DRUGS IN THE SPOTLIGHT:

Potassium

MANY heart-failure patients - thought to be about 900,000 people in the UK - experience fluid build-up in the lungs which causes breathing problems and swelling in the legs.

This is why they are often prescribed diuretics, which help their kidneys excrete more fluids and salts. Diuretics are also prescribed for high blood pressure.

However, a potential side effect is that either too much potassium is removed from the body or too much is retained. The vitamin is needed for muscle health, which includes heart muscle.

'Patients with low potassium may start off feeling washed out

and not as energetic as usual, and if levels become very low it can prove life-threatening,' says Simon Maxwell, a professor of clinical pharmacology at the University of Edinburgh.

He says that potassium levels will usually be checked soon after a patient starts taking diuretic pills, and 'some patients will be put on potassium supplements'.

However, it's important not to take supplements unless prescribed as if potassium levels rise too high, this can cause people to feel unwell, and their heart may start beating either too fast or slow, among other symptoms.

DIABETES PILLS IN THE SPOTLIGHT:

Vitamin B12

METFORMIN, one of the top-ten drugs prescribed in England, lowers blood sugar by improving the way the body handles insulin, and is typically given to people with type 2 diabetes.

The Medicines and Healthcare products Regulatory Agency (MHRA) sent out new advice to doctors last June warning that those on metformin are at risk of Vitamin B12 deficiency.

'They said that it may affect one

STATINS

IN THE SPOTLIGHT: Coenzyme Q10; Vitamins A, D, E, K

A side effect of one of the most prescribed statins - Atorvastatin - is that it blocks the release of an enzyme called coenzyme Q10.

Low levels of this enzyme may cause leg cramps and, less commonly, muscle weakness and shortness of breath.

Pharmacist Sultan Dajani says: 'Taking statins can deplete levels of certain fat-soluble vitamins such as A, D, E and K. Look out for signs of deficiency such as tiredness. Supplements may help to tackle the problem.'

in ten people taking metformin,' says Professor Maxwell.

Vitamin B12, which is needed for energy and red blood cell formation, binds to a protein so it can be absorbed in the gut, and metformin is thought to interfere with this process. The MHRA advises that anyone taking metformin should seek medical advice if they 'develop new or worsening symptoms of extreme tiredness, a sore and red tongue, pins and needles, or pale or yellow skin'.

STEROIDS

IN THE SPOTLIGHT:

Calcium and Vitamin D

CORTICOSTEROIDS, often known as steroids, are anti-inflammatory drugs prescribed for a number of conditions, including asthma, but they can have a major effect on the body's absorption of calcium and Vitamin D.

'In the long term, steroids can lead to the breakdown of bone - which happens to all of us in time, but these speed up the process,' says Professor Maxwell.

'That's why doctors prescribing oral steroids will normally try to limit this to the shortest period possible and prescribe Vitamin D and calcium alongside them.'

'Patients shouldn't self-prescribe calcium as there is a process by which calcium in excess can cause calcification [hardening] of blood vessels.'

Low doses of steroids in preventer inhalers do not cause the same side effects.



When are premium vitamins worth it?

THE cost of supplements can vary hugely, but sometimes it's worth paying more.

A main boast of premium brands is that their formulations boost the rate at which your body absorbs their nutrients. Whether this is actually needed depends on the individual.

For instance, low-cost calcium supplements contain calcium carbonate, while premium supplements might use calcium citrate or chelated calcium, which studies show is absorbed more easily.

'Calcium citrate, which contains less calcium, has a 20 per cent better absorption rate,' says Aidan Goggins, a pharmacist and independent adviser to the supplement industry. 'You might want to consider paying more for calcium citrate if you've got low levels of stomach acid or you're taking medication to reduce stomach acid.'

It's a similar story with zinc. A low-cost product will often contain zinc gluconate, which can cause nausea, while a more expensive formulation may use zinc citrate or zinc acetate, which are easier to absorb.

Goggins suggests paying for more expensive brands only if you experience gut problems.

Other nutrients are sometimes bound with fat and water molecules to create something the body more readily accepts.

Other products have added piperine, because curcumin, the active ingredient in turmeric, is poorly absorbed. Research shows that piperine can boost absorption by 2,000 per cent.

'It sounds impressive, but a 2,000 per cent improvement on a very small number is still a small number,' warns Goggins.

Compiled by LOUISE ATKINSON, CAROLINE JONES, PAT HAGAN and LUCY ELKINS

Note: Consult your GP or pharmacist before taking vitamins or supplements, particularly if taking any prescribed medication, in case of contraindications.

TOMORROW SUPPLEMENTS FOR YOUR HAIR, SKIN ... AND THE MENOPAUSE