

SPECIAL REPORT

Vitamins in plants

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Introduction

Preconceived ideas often put together **vegetarian** or **vegan** diet with overabundance of vitamins. Of course! With such a diet you are eating vegetables all the time!

As far as I am concerned, except vitamin C in fruits, I didn't know much about it before I started to investigate in detail the actual content of food that I was eating.

For sure you will find most of the vitamins in **large amounts** in fruits, vegetables, legumes, cereals, aromatic herbs and spices without too much of an effort.

The problem is that some of the vitamins are **missing** in plant-based food, or appear to be hardly assimilable by the digestive system.

Many supporters of plant-based diets compare our needs to those of other species close to human, such as the great apes – gorillas and chimpanzees for instance.

Look! Those apes – except lice taken out from their congeners' hair – only eat fruits and are much sturdier than many of us!

Well... reality is not that simple.

For instance gorillas, like rabbits, eat some of their excrements to compensate for a lack of nutrients. They also eat termites.

As for the chimpanzees, they add to their diet small mammals (small monkeys) that they hunt in group.

Suddenly we end up far away from the former idea of “In fruit paradise, everything is sweet”!

Hopefully science helps us to understand more precisely what we need to **balance our diet**, and we are going to study in this report how to avoid vitamin deficiencies, as well as how to find all the vitamins we need to maintain **a good health**.

What are vitamins?

Keep in mind

Vitamins are necessary nutrients for the **smooth running** of your body.

To stay healthy, your body needs a **regular** – and non excessive – intake of all vitamins. Moreover your vitamin needs depend on your age, your gender, your physical activity and your weight.

Vitamins A, D, E and K can be stocked in your body while vitamins B and C cannot, with one important exception: vitamin B12.

Balance in vitamins requires a **proper digestion** and **quality food**.

Un équilibre en vitamines requiert une **bonne digestion** et des **aliments de qualité**.

Why do we have to eat vitamins?

Vitamins help to the smooth running of your immune system, your digestive system, your respiratory system, your hormonal system, together with the generation of your cells: let's say that they are really **essential** in every part of our organism!

Vitamin deficiencies trigger symptoms that differ depending on which is the missing vitamin, and that can be irreversible. This is the reason why it is so important to maintain a proper **digestion**, in order to **assimilate well all the nutrients**, and to choose fresh food with the best possible **quality** (because mass production makes foods that contain less and less nutrients).

Vitamin C as also a particular **antioxidant** role: it means that it permits to counter the effects of oxidants sur as radicals.

Radicals are molecules reacting with the fatty components of the cells, leading to the destruction of those cells.

Therefore, with a daily intake of vitamin C you give a **boost to your immune system**, together with helping slowing down the aging process and helping the production of **blood cells** and **collagen** (the main protein composing your body).

The 2 groups of vitamins

There are 2 main categories of vitamins: the water-soluble vitamins and the fat-soluble vitamins.

As fat-soluble vitamins (A, D, E and K) can be stocked in fat, your liver is able to **store** and use them according to your needs. You still need to maintain a regular intake of those nutrients to keep a sufficient amount in your body, but you don't really have to bother about doing so everyday.

On the other hand water-soluble vitamins (B and C) are not store by your body. Hence everything that is not used after being ingested is flushed out in urine. This is the reason why you need a **regular intake** in order to keep a good health.

As in every rule, there is an exception: vitamin **B12**, which is water-soluble but is stored anyway in the liver, the brain, the heart and the pancreas.

Is it necessary to take some vitamin supplements?

Whenever your immune system needs a little bit of a boost (for instance during the winter or during epidemic time), or when your diet doesn't contain some of the vitamins, I advice you to use vitamin supplement.

For instance during the winter, if you have few opportunities to prepare a wide selections of fruits or large salads during your day, a vitamin C tablet will provide you a great **amount of antioxidant** and will make it easier for your immune system to fight against the rigors of winter. It will also help to **compensate for the lack of fresh fruits and vegetables** during this season.

If you are a vegetarian or a vegan, your intake of vitamin B12 has to be **closely monitored** because the plants that may contain some are neither containing vitamin B12 for sure, nor a vitamin B12 that your body can **actually assimilate**.

Most of the large vegetarian associations in the world recommend to perform a **yearly medical check** and an **intake of vitamin B12 supplement** to avoid any risk of deficiency.

A few misconceptions about vitamins

You should not eat vitamins in the evening

I often heard assertions about vitamins, particularly about eating fruits in the evening.

“I avoid eating fruits for dinner because vitamins prevent me from sleeping!”

Eating fruits, even those containing large amounts of vitamin C, will allow your body to better work, specially during your sleep which is the best ever regeneration time in the daily cycle!

What can prevent you from sleeping however is the fact that you had no, or very few, **physical activity** during the day **and** to eat many fruits for dinner: soon after you will have a **huge boost of energy** that will **galvanize** you around half an hour following the dinner. It is recommended to avoid eating just before bed anyways.

Another factor is the **psychological** part of this belief.

I actually tested it for you in this way: a patient told me that he wouldn't eat any vitamins nor fruits in the evening because he was always woken up by it 5 hours later.

So I did composed my dinners with a large part of fruits and vegetables, especially those rich in vitamin C (oranges and grapefruits, strawberries, raspberries, green salads with fresh squeezed lemon juice, kiwis, etc), and then:

- during the first week I went to bed thinking “after such a dinner, for sure I will wake up in only 5 hours”,
- and during the second week I went to bed saying to myself “this dinner was light and rich in vitamins, so I'll have a good sleep”.

Without great surprise, during the first week I woke up during the night (except this one before which I had practiced an intense physical activity in the evening), and during the second week I slept normally (from 7 to 8 hours without any interruption).

We should take vitamins before winter to get protected from sicknesses

Nothing proves that you can stay away from sicknesses by “getting prepared” in this way before the cold season.

However a vitamin supplement, or a dedicated attention to buying fresh fruits and vegetables, many, varied and with good quality, helps greatly to **keep your immune system up and running** during the winter, season during which we often have a tendency for a richer and less balanced food.

Vitamin supplement are a solution against fatigue and stress

The solution against fatigue is most often 1) to take care to have a long enough quality sleep, and 2) to keep up with a balanced diet. Your fatigue will be always more pronounced if you neglect your diet, especially during periods when you experience high levels of stress.

As for the stress itself, you won't be able to get rid of it by eating something, even if it is written in golden letters on the package!

The simple act of paying attention to the **balance of your diet** is a first step toward a **healthy and harmonious life**. It is a tool that will permit you to give to your body the **energy** it needs to face fatigue and daily stress.

Both anti-stress and anti-fatigue tools lie within yourself; we are getting off-subject, I will speak about this in a next chapter ;-)

Freezing fruits destroys vitamins

By buying fresh fruits and vegetables and by freezing them **quickly** (using the express-freeze-like function of your freezer), you will keep most of the nutritive qualities of your food.

Like so, vitamins will be **available** even after the season, or to blend smoothies and greenies fresh and various at any moment of the week.

The best choice to make so is to freeze **seasonal fruits and vegetables**: they are usually fresher and so contain more vitamins than those which have been already stocked for a while. This is also true for the products that you keep at home, **eat them as fresh as possible**.

Vitamins to be closely monitored

Vitamin D

This vitamin is produced by your body when your skin is exposed to sun, with a **sufficient intensity of UVB**. Hence this depends on the **season** and your **geographical position**.

For instance in Spain or in Greece, you need **10 to 20 minutes of exposure** on your arms and legs to allow your body to produce your own main vitamin D needs. On the contrary, in Belgium between october and march, the ozone layer absorbs too many UVB rays and you can't receive enough of them... Same thing if you spend the whole day **indoors**.

If you realize you don't get enough sun during the season, fruits and vegetables will bring you **almost no vitamin D** and your own natural stocks will **decrease**.

There are some special foods enriched with vitamin D (enriched vegetal milk or cereals, sun-dried white mushrooms...), but this will most likely cost you a fortune during the winter. I'd rather advise you to use your food budget on fresh fruits and vegetables and get a **vitamin supplement** during the winter.

Beware if you are pregnant or breast-feeding: if you have a deficiency in vitamin D, so does your milk and you might end being both deficient.

Vitamin B12

When you are involved in **vegetarian diets**, there is one subject that requires your attention: the vitamin B12 content in food.

Indeed, this vitamin is, so to speak, nonexistent in plants. This is due to the fact that it is produced **by bacteria** that are present in some soils and within the digestive system of some animals. Yet our intestine is too short to allow those bacteria to produce vitamin B12 fast enough for us to assimilate it.

So if you are a vegetarian eating **eggs and cheese**, you will eat a small quantity of this vitamin (which still might be not sufficient). And if you follow a vegan diet, most probably you will be lacking of vitamin B12.

Be aware that the largest vegetarian associations in the world recommend to use vitamin B12 supplement, especially for vegans, together with a yearly check of your level of B12 in your body to avoid any deficiency (that could be **irreversible**).

The vitamins you will find in plants (summary table)

Vitamin A (retinol)	1 to 1,5 mg/d	Green and yellow vegetables, sweet potatoes, carrots, spinach, pumpkins, cabbages, melon
Vitamin B1 (thiamine)	1 to 2 mg/d	Oranges, legumes (red beans, lentils), germinated wheat, yeasts, peanuts
Vitamin B2 (riboflavine)	1,5 to 2 mg/d	Wholegrain cereals, green vegetables, nuts and seeds, yeasts
Vitamin B3 (PP, niacin)	20 to 35 mg/d	Wholegrain cereals, peanuts, germinated wheat, dried apricots, mushrooms, avocados
Vitamin B4 (adenine)		Yeasts, cereals, tea, and a little bit in almost any kind of food (you generally don't lack of it)
Vitamin B5 (pantothenic acid)	5 to 10 mg/d	Bran, raw mushrooms, sunflower seeds, wholegrain rice, legumes
Vitamin B6 (pyridoxine)	2 to 4 mg/d	Garlic, chickpeas, nuts and seeds (pistachios, sunflower, sesame...), potatoes, wholegrain rice
Vitamin B8 (H, biotin)	1 to 2 mg/d	Legumes, soya, nuts and seeds, germinated wheat, mushrooms, avocados, strawberries, bananas
Vitamin B9 (folic acid)	0,2 to 0,4 mg/d	Green vegetables (spinach, lettuces, asparagus), beetroots, legumes and peas, soya, seeds (sunflower and linen), nuts, watercress, yeasts, chestnuts, corn, germinated wheat
Vitamin B12 (cyanocobalamin)	5 to 10 µg/d	Enriched, vegetal milks (check the labels) + read the previous page on the subject (above)
Vitamin C (ascorbic acid)	75 mg/d	Berries (blackcurrant, strawberries...), cabbages, citrus fruits (lemon...), kiwis, pineapple, lettuces, potatoes, broccolis, peppers, beetroots, papayas, mangos, guava
Vitamin C2 (P)	-	Citrus fruits skin (zest), capers, onions, apples, buckwheat, tea, broccoli, tomatoes
Vitamin D (cholecalciferol)	0,05 to 0,12 mg/d	Exposure to UVB, enriched vegetal milks (check the labels), mushrooms (very low content)
Vitamin E (tocopherol)	15 mg/d	Seeds (almonds, sunflower, hazelnuts...), peanuts, bran, lettuces, avocados, vegetal oils, germinated wheat
Vitamin F (linoleic acid)	10 to 15 g/d	First cold-pressing vegetal oils (organic if possible)
Vitamin K	0,05 to 0,1 mg/d	Anything green (spinach, green beans, lettuces, kiwis, seaweeds...), tomatoes and vegetal oils

(Recommended intake per day data are given for information only, the exact quantity you need depends on your age, gender, weight and physical activity)

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