



SCIENTIFIC ANALYSIS PROVIDES PERSONAL DIETARY ADVICE

How healthy is my diet really?

Not everyone gets enough vitamins from their food. You can find out whether you are getting enough of these essential nutrients from NutriProfiel, an analysis of your blood values and eating habits developed by doctors and scientists. Reporter Tessa Louwerens tested it for herself.

TEXT TESSA LOUWERENS PHOTOGRAPHY ALDO ALLESSI INFOGRAPHIC PETRA SIEBELINK (WUR)

It is quiet in the Gelderse Vallei hospital (ZGV) in Ede, where I am waiting my turn to have a blood sample taken. I'm in perfectly good health; I'm here for a bit of research of my own. I see myself as a fairly fit person: I exercise regularly, don't smoke, and I think I have a healthy diet. But how healthy is my diet really, and what could be better?

NutriProfiel has the answer, says the website. It can give me personalized dietary advice based on my blood values and eating habits. It is a project of the Dutch Nutrition in Healthcare Alliance (Alliantie Voeding in de Zorg), whose mission is to apply scientific findings on diet and exercise in healthcare. The key partners are Wageningen University & Research, the Gelderse Vallei hospital and Rijnstate hospital in Arnhem.

Four tubes of blood are taken so as to measure levels of haemoglobin, ferritin (iron level), folic acid, and vitamins B6, B12 and D. 'Those values provide a picture of the long-term balance of the micronutrients,' explains Michiel Balvers, a researcher in the Human Nutrition and Health chair group in Wageningen and the NutriProfiel project leader. The body lays down a store of certain vitamins. You have a buffer of B12, for example, to last you over a year. Balvers: 'So if your blood values are too low, you've had a deficiency for some time.' It is these vitamins for which the values are measured because deficiencies are common. 'About 20 per cent of the elderly have too little B6,' says Balvers. 'We also see in our analyses that 5 to 10 per cent of the patients have a folic acid or B12 deficiency. And in winter

you can assume that half of the Netherlands has a vitamin D deficiency.'

Deficiencies can cause serious health problems. A lack of B12, for instance, can cause neurological symptoms such as exhaustion, tingling feelings, memory loss and muscle cramps. Insufficient vitamin D increases the risk of fractures. Balvers: 'With NutriProfiel we can bring dangerous deficiencies to light in time, before serious and sometimes irreversible symptoms occur. Like permanent neurological damage caused by a long-term vitamin B12 deficiency.'

But the test results don't tell you everything. 'You can't really interpret the blood values properly if you don't know what a person eats,' says Balvers. So the blood test is complemented with the *Eetscore* (eating score) questionnaire developed by the >

Human Nutrition and Health department. At home at my PC, I spend 15 minutes answering questions about how much I eat of various product categories, and how many times a week I eat them. The categories are dairy produce, whole grain products and vegetables. That information is set against the Dutch Nutrition Centre's Healthy Diet Guidelines.

Some questions are hard to answer, like how many 50-gram spoonfuls of vegetables I eat per day. How reliable is my memory? I don't weigh my food. 'The questionnaire has to be easy to fill in, so you don't have to weigh your food,' says Balvers. 'The eating score measures the quality of your diet. If you fill in the questionnaire honestly, it gives a good picture of the degree to which your diet matches the guidelines, and where there is room for improvement.'

The programme draws up personalized dietary advice based on the *Eetscore* questionnaire and the blood tests. While I'm waiting for that, I call Ben Witteman, a gastro-intestinal consultant at ZGV who has been involved in NutriProfiel from the start. He uses the method in his practice, and even as

NutriProfiel also helps make people more aware of how important diet is, says Witteman. 'Patients will tell me that their diet is healthy. But when I see their answers on the *Eetscore*, there can be room for improvement. I can go into that with the patient. Everyone has some idea of what is healthy, but few people follow the Healthy Diet Guidelines.'

FEELING BETTER

Witteman notices that patients often feel better after changing their eating habits. 'Diet is important: not just for keeping people healthy, but also for helping people with chronic conditions feel better. I have identified and then treated several coeliac patients through NutriProfiel, for instance.'

My NutriProfiel result is ready in just under a week after the blood test. I'm curious and a tiny bit nervous. Maybe I too, like those patients of Witteman's, have a distorted idea of what is healthy.

My blood test results are good, except that my iron level is low. Iron deficiency can lead to anaemia because your body manufactures less haemoglobin, resulting in tiredness,

citrus fruits with a bread-based meal: vitamin C supports the absorption of iron. Polyphenols in coffee and tea do just the opposite.

From the eating score questionnaire, it seems that my diet is generally fairly healthy (illustration 1), although I don't get the recommended daily allowance of 150-200 grams of vegetables (4 serving spoons). I could improve that by making homemade soups with vegetables, perhaps frozen, or by eating a vegetable omelette. My diet is low in certain vitamins too (illustration 2). My vitamin D score is particularly low. That could be boosted by spreading more margarine on my bread, as vitamin D is added to that.

NO HARM?

What about vitamin pills? Balvers says that generally speaking, they are unnecessary. 'In fact, you sometimes run the risk that you get too much. In the case of vitamins, it is certainly not always true that "it can't do any harm". Supplements often contain vitamins in large doses, sometimes a lot more than it says on the label.'

You excrete an excess of vitamin C in your urine, but that is not the case with all vitamins. Balvers: 'In 10 per cent of our blood samples, we see levels of vitamin B6 that are too high. That is due to supplements, because you won't get amounts like that from your food. Every year in ZGV, we see a few patients with vitamin B6 toxicity.' One of the most famous of these was the skater Sven Kramer, who incurred nerve damage in his right leg as a result and could not skate for a winter.

In my case, most of the vitamins in my blood are on the low side. But according to NutriProfiel, I don't need to go on supplements. Balvers: 'Theoretically, you can get all the nutrients you need from a vegetarian diet. Eat pulses regularly, for instance, and eat meat substitutes with added iron and B12. Especially if you do a lot of sport, for instance. And if you are going to take a supplement, make sure it doesn't contain

'I have identified several coeliac patients using NutriProfiel'

a diagnostic tool. 'Let's say you see that a person has low blood values but a healthy diet. Then you first look for other causes such as intestinal problems that impede the absorption of vitamins.' As well as this, NutriProfiel can be used preventively. 'If the blood values are good, but the person's eating habits could cause deficiencies in the long term, we can intervene in time.'

paleness and getting out of breath easily. It turns out my diet doesn't contain enough iron. NutriProfiel advises me to eat iron-rich products (with more than 0.8 milligrams of iron per 100 grams) such as meat, fish and whole grain bread. Or, for vegetarians like me: eggs (four per week is enough), tofu, tempeh, nuts and iron-rich readymade meat substitutes. It is also sensible to eat more

NUTRIPROFIEL

Reporter Tessa Louwerens did NutriProfiel's vitamin check. Personalized dietary advice is based on the vitamin levels in people's blood and an analysis of their eating habits.



Measuring vitamins



Analysing eating habits



Personalized dietary advice

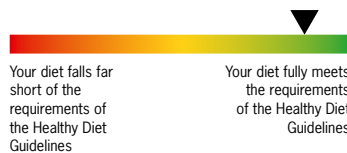
Blood values

Values measured

• ferritin	12.5 µg/l
• folic acid	26.8 nmol/l
• haemoglobin	8.2 mmol/l
• vitamin B12	233 pmol/l
• vitamin B6	69.5 nmol/l
• vitamin D3	99.4 nmol/l

Eating habits score

Your total score: **139** out of 160



Vitamin score

Vitamin	score
vitamin B12	5.7
vitamin B6	5.3
vitamin D	1.4
iron	4
folic acid	5

A score between 0 and 10 indicates per vitamin how much the diet provides.

Dietary advice

The dietary advice explains what you can do to boost your vitamin score.

For vitamin D and iron, for example:

Vitamin D

Your diet does not include enough products that are rich in vitamin D

Iron

Your diet does not include many iron-rich products

Advice: Eat more products that are rich in vitamin D, such as:



meat



oily fish



eggs



butter/margarine

Advice: eat more iron-rich products, such as:



meat



fish



eggs



tofu/tempeh



nuts



pulses



wholegrain products



green vegetables

more than 100 per cent of the recommended daily dose.'

NutriProfiel was started five years ago and has already achieved a lot, says Balvers. 'We started out with three GPs, and now we're working with all the GPs in the region and several specialists at ZGV, and we are creating dozens of profiles every week.'

NutriProfiel is free for people referred by their GP, while consumers who want to take the test on their own initiative pay 89 euros. There has not been any research on whether

people follow the advice they get. Balvers: 'NutriProfiel brings together the science on a healthy diet and uses it for practical advice on how to eat according to the Healthy Diet Guidelines – which have been proven to contribute to your health. We have not investigated whether our recommendations are actually leading to behaviour change.' There is, however, work going on to support people in putting the advice into practice. Wageningen municipality, for instance, joined the Nutrition in Healthcare Alliance

six months ago and started a project that links NutriProfiel to cookery courses in a community centre, aiming to help people cook healthy affordable meals.

It is true that it is surprisingly difficult to change your habits and I don't know if I'll manage, but I'm going to try. Time to dust down the blender and make soups, and I can easily manage four eggs a week, given the rate at which my chickens lay them. ■

<https://nutriprofil.nl/english>