



## A Little Wiser

# Is it OK to re-heat spinach?

It always used to be said that you mustn't re-heat spinach. But why not, actually? And is it true?

According to associate professor of Dietary Assessment Jeanne de Vries, this idea dates back to the time when not every household had a fridge. 'Spinach and other leafy vegetables contain nitrates, which are not bad for you as such,' she says. 'In fact, research has shown that nitrogen oxide, which is formed from nitrate, can lower your blood pressure, so it is good for your cardiovascular health.' But under certain conditions and at particular temperatures, bacteria convert nitrates into nitrite, which can then be converted into carcinogenic nitrosamines in the body. De Vries: 'That conversion of nitrate into nitrite only happens at high temperatures. The time it takes to cook or heat up spinach is short and doesn't give bacteria time to convert nitrate. So as long as you keep leftover spinach in the fridge in the interim, there's no problem.'

'Nitrate can also be converted into nitrite in your body. But the amount of nitrate we ingest through our food is very small.' It can cause problems for babies, however. Too much nitrite can cause Blue Baby Syndrome: nitrite binds to red blood cells in the bloodstream, preventing the cells from transporting oxygen. This process is less easily reversible in babies than in adults. Blue Baby Syndrome is usually caused by polluted drinking water and

occurs mostly in developing countries, where people in rural areas get their drinking water from wells.'

As with any substance, the toxicity of nitrite depends on how much you ingest. De Vries: 'With the amounts of leafy vegetables we eat, you don't generally consume too much nitrate. What is more, vegetables also contain antioxidants, and those prevent the conversion of nitrate. Also, our drinking water is purified and there are legal limits to the amount of nitrate that is permitted. Nitrites are actually added to processed meats to improve their shelf life and colour, and there are norms for that as well. Unlike vegetables, though, meat does not contain any antioxidants, which is why the Netherlands Nutrition Centre advises against frequent consumption of processed meats, due to their association with stomach and bowel cancers.'

Conclusion: It's no problem to re-heat spinach leftovers as long as you store them in the fridge.  $\pi$



## 'Vegetables contain antioxidants, which prevent the conversion of nitrate'

Jeanne de Vries, associate professor of Dietary Assessment

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