

INTERNATIONAL YEAR OF PULSES



Bring back the bean

Pulses are becoming steadily less popular. And that is bad news, says the world food organization FAO. If we are to feed the fast-growing world population it's time the super-healthy, environmentally friendly bean made a comeback. As steak, for instance.

TEXT ASTRID SMIT PHOTO STUDIO 38°C / REMCO LASSCHE

Brown beans, haricot beans, lentils, marrowfat peas... familiar-sounding foods, aren't they? Yet we've been eating less and less of these pulses over the past few decades. 'I don't say grace for brown beans', grumbled Bartje, a farm labourer's son in Anne de Vries's children's book. A sentiment apparently widely shared in the Netherlands as meat came onto the menu, pushing pulses off the plate. Currently half the population hardly ever eats pulses (the term denotes dried beans; green beans, mange-tout and peas count as vegetables), while ten percent of the population eats about eight grams a day. And the Netherlands is not alone in this trend. All around the world, as soon as consumers can afford it they opt for meat and dairy as their main sources of protein. Even in a largely vegetarian country such as India, the consumption of pulses has gone down and meat consumption has gone up. That has got to change, says the FAO, and declared 2016

the Year of Pulses. In the world food organization's view, it is time to put pulses back on the menu. For the sake of our health – pulses are rich in protein and important vitamins and minerals. For the sake of the environment – pulses use less water and energy than livestock. For the sake of soil fertility – with the aid of bacteria, pulses bind nitrogen from the air, improving soil quality. And for the sake of food security – pulses are cheap and can feed more mouths than meat.

Judging by the latest Dutch dietary guidelines, the FAO's message was already getting through in the Netherlands last year. The Dutch Health Council (led by Wageningen emeritus professor Daan Kromhout) published its new dietary guidelines early this year, advising people to eat pulses at least once a week because there is now firm evidence that they can lower levels of 'bad' cholesterol in the blood. So in the new 'Wheel of Five' depicting essential food groups, pulses are more prominent than >

‘The bean needs a new lease of life’

ever before. At around the same time, the ‘Happy Bean’ campaign was launched, in which bean producers, caterers, cooks and health experts seek to improve the humble bean’s image by seducing people with interesting recipes spread via travelling vans, company canteens or social media.

WIND

Cor van der Weele, special professor of Humanist Philosophy at Wageningen University & Research, welcomes these initiatives but questions whether they will suffice. ‘Pulses have a long way to go in the Netherlands. We associate them with wind and with poverty, with Bartje’s bean mash. ‘In fact, the bean needs a complete makeover,’ says Van der Weele. ‘Not just technologically, but culturally. The bean will have to acquire new connotations and associations, such as ‘hip’, ‘global’, ‘paleo’, ‘high-fibre’, ‘packed with protein’ and ‘food of the future’.

An earlier attempt to promote pulses as meat substitutes was made in the 1970s, says Van der Weele, but that didn’t make us eat any more of them. She is hopeful though. She did research on the acceptance of in vitro meat and ordinary meat, and discovered that consumers today are more ambivalent about meat than they were then. ‘That is not causing behavioural change yet, but I think that beneath the surface the necessity of meat is no longer taken for granted. My guess is that consumers will be won over once an appealing and cheap alternative becomes available. But will that be the bean as such?’ Van der Weele wonders out loud.

BEAN STEAK

To cater for confirmed meat-eaters there is another option: processing the pulse until it is just like meat. And considerable success is being booked. Several Dutch companies are selling products resembling hamburgers, chicken or sausages but made of protein from pulses, mainly soya. It is already hard to imagine a supermarket without these options, although they could still be further improved. Atze Jan van der Goot, professor of Protein Structuring and Sustainability at Wageningen: ‘The taste is pretty similar to that of meat and the texture’s not bad either. But sadly, the variation in texture is still limited and these products are still quite pricy compared with meat.’

So his research group is using new, cheaper technologies to try to imitate the bite of a wider variety of kinds of meat. Using the shear cell technique, which makes fibre out of plant protein, his group took soya and wheat and created something resembling a beefsteak which you can really get your teeth into. Van der Goot: ‘Now we are waiting for a company that wants to upscale our machine and invest further in the alternative steak – because the taste and juiciness could be even better.’ In order to widen the possibilities, his group is investigating the potential of other pulses than soya, such as green peas or lupin, a bean which is not eaten here but which contains as much protein as soya. Because you can’t just replace soya with any other pulse. Van der Goot: ‘Lupin binds the water in a different way than soya, and the pea has such a pronounced taste that you



PHOTO HOLLANDESE HOOGTE

Pulses processed into vegetarian steak.

would have to mask it if you wanted to use it a lot in meat substitutes.’

He is also looking into whether the ingredients for vegetarian products could be produced more efficiently. Currently soya is processed in separate factories where the protein and carbohydrate are extracted before being taken to the factory where products such as soups and sauces are made. When they are used in meat substitutes, the protein and carbohydrate are often mixed again. ‘Maybe you don’t have to separate the protein and carbohydrate in the beans quite so completely. That could save a lot of energy and money,’ says Van der

Goot. An important point. Because some meat substitutes, for instance those in which animal proteins such as egg are used as well, consume so much water and energy that their scores for energy consumption and CO₂ emissions are no better than those of chicken.

COUNTING BEANS

In the west the main arguments for putting pulses back on our plates are health and environment-related; in developing countries the key issues are food security and soil fertility. Pulses are cheap and the plants they grow on, legumes, are good nitrogen fertilizers. Farmers who grow beans can avoid undernutrition, do not have to buy as much expensive artificial fertilizer, and improve the soil quality in their fields. And beans are very marketable because even if people all around the world are eating fewer beans, demand is still growing due to population growth. Yet farmers in poor countries such as those in Africa are not benefitting enough from these advantages. Pulses are grown on about 10 percent of African agricultural land south of the Sahara. In 2010, therefore, Ken Giller, professor of Plant Production Systems at Wageningen, launched the project N2Africa, which is funded to the tune of 20 million dollars by the Bill & Melinda Gates foundation. 'In the first phase we sought to apply recently gained knowledge about cultivating pulses, working with small farmers – 250,000 of them in eight African countries.'

N2Africa chose four major types of bean (common bean, cowpea, groundnut and soya bean) and researched which conditions best suited each crop, what they do for the soil fertility, what forms of crop protection against pests and diseases they need, and what yields could be achieved. The bean plants were inoculated with nitrogen-fixing bacteria. This unusual move was a success, says Giller. Many farmers achieved higher yields, and the soya bean harvest in northern Nigeria almost doubled. Since 2014 Giller has been working on the second phase of N2Africa, in which the Bill & Melinda Gates foundation has invested 30 million dollars. 'We are trying to upscale the concept of the first phase, with 500,000 new farmers in 11 African countries, and we are aiming at even higher yields and profits.' The concept can be exported to other continents too, believes Giller, but he is concentrating on Africa for now. 'We've got our hands full with this project. And the need is greatest here. The



PHOTO N2AFRICA

One of the N2Africa project's trial fields in Uganda, with several different bean varieties and cultivation methods.

projection is that there will be one billion more Africans by 2050.'

BETTER DIET

N2Africa is also doing research on the extent to which cultivating pulses really does improve the nutritional status of the farmers and their families. PhD researcher Ilse de Jager is studying whether young children in these families have a better diet if their parents harvest more pulses. Her initial data suggest that they do. She is also looking at what constitutes the best possible diet under local conditions. 'How much maize and soya beans do children need to eat, for instance, for an optimal diet? I compare that with their current intake and look for the shortfalls,' says De Jager.

What with all these initiatives and the global interest in the Year of Pulses, beans may yet make a comeback on menus around the world. Ideally the countries which already eat a lot of beans should carry on doing so, even as they become richer, while western countries should eat more pulses. Technologist Van der Goot: 'It would be great if the countries that are getting richer shifted straight to eating meat substitutes, and saw them as a product in their own right rather than a substitute for meat. That would give us far more scope.' ■

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