


WAGENINGEN WORLD

MAGAZINE OF WAGENINGEN UR ABOUT CONTRIBUTING TO THE QUALITY OF LIFE

no.1 2016



'By nature, farmers
are caring people'

Multifunctional agriculture, page 34

Your **personal dietary advice** | **Crowdfunding** for research | **Railway** to China awaits exporters
Starving **porpoises** | More food, lower **emissions** | Transport pallets from **coconut waste**



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WORKING OUT WHAT YOU SHOULD EAT

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Departing professor Pier Vellinga hopes greenhouse gas emissions from agriculture will go down after the Paris agreement. Meanwhile agricultural scientists are working on production methods that can cope with the effects of climate change.



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DUTCH FARMERS ARE BRANCHING OUT

One in five Dutch farms combines agriculture with a care facility, a campsite or a shop. 'You need to be permanently offering a quality product, have good communication skills, develop a strategic vision and to be good at organizing.'



COLOPHON Wageningen World is the quarterly magazine for associates and alumni of Wageningen UR (University and Research centre) and members of KLV, the Wageningen Alumni Network. A PDF version of the magazine can be found at www.wageningenUR.nl/en/wageningen-world **Publisher** Wageningen UR, Marc Lamers **Editorial Board** Hans Bothe, Yvonne Fernhout, Ben Geerlings, Bert Jansen, Jeanette Leenders, Jac Niessen, Irene Salverda, Erik Toussaint, Delia de Vreeze **Editor-in-chief** Pauline Greuell (Corporate Communications Wageningen UR) and Edwin van Laar (Editor-in-chief Resource, Wageningen UR) **Magazine editor** Miranda Bettonville **Copy editor** Rik Nijland **Alumni news** Yvonne de Hilster **Art direction and design** gloedcommunicatie, Nijmegen **Cover picture** Hollandse Hoogte **Overall design** Hemels Publishers **Printer** Tuijtel Hardinxveld-Giessendam **ISSN** 2210-7908 **Address** Wageningen Campus, Akkermaalsbos 14, 6708 WB Wageningen, Postbus 409, 6700 AK Wageningen, telefoon 0317 48 40 20, wageningen.world@wur.nl **Change of address** alumni@wur.nl **Change of address associates** wageningen.world@wur.nl, o.v.v. code adreslabel **Change of career details** alumni@wur.nl

The mission of Wageningen UR (University & Research centre) is 'to explore the potential of nature to improve the quality of life'. Wageningen UR includes nine specialist applied research institutes and Wageningen University. These institutions have joined forces to contribute to finding answers to crucial questions related to healthy food and a sustainable living environment. Wageningen UR has a staff of 6,500, 10,000 students, 35,000 alumni and 40 sites, with a turnover of 662 million euros. Institutes of Wageningen UR: Alterra, LEI, Plant Research International, Applied Plant Research, Wageningen UR Livestock Research, Central Veterinary Institute, Wageningen UR Food & Biobased Research, IMARES and RIKILT.



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What a waste, all those trains returning from Europe to China half-empty, thought Xiaoyong Zhang of Wageningen UR. Transporting goods along the Silk Road is faster than shipping them and cheaper than airfreight.

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Sometimes starved porpoises wash up on the coast when there is plenty of prey swimming around. Young porpoises appear to find it difficult to catch enough oily fish.

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The success or decline of big European cities is often closely linked with their location in the landscape. What are the implications of that now the climate is changing?

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Transport pallets made out of coconut husks are cheaper and more sustainable than traditional wooden pallets. Coconut farmers will share the benefits.

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PHOTO GUY ACKERMANS

Fending off the Zika virus

'In February I went to Surinam with doctors and virologists to see how we can help in the fight against the Zika virus. Naturally, the Surinamese are worried too, but there is less panic there than in Europe. That is simply because people in tropical countries are more used to disease-carrying mosquitoes. In Paramaribo dengue and chikungunya are seen as more of a health risk than Zika. People with Zika stay at home with flu-like symptoms for a couple of days and then they go back to work.

Nevertheless, there is every reason to fight the mosquito in question. Now that the Zika virus has travelled from Africa to South America, new risks are coming to light. These include a possible link with microcephaly, which causes babies to be born with skulls that are too small, and with an auto-immune disease called Guillain-Barré syndrome. With all the global transport routes, I don't expect it us to be able to eradicate the virus. But to keep Zika at bay we need to employ a combination of strategies. These include judicious use of insecticide spraying, mosquito traps, biological products for getting rid of the larvae, possibly the use of genetically modified male mosquitoes whose offspring are sterile, and eventually a vaccine. It is essential that you the local people on your side in this.

In Surinam there are billboards urging people to clean up mosquito breeding places in their gardens. In Brazil the army is handing out leaflets. But just handing out information doesn't work. Nor does, for example, a new mosquito trap if it is used wrongly or not at all, or a vaccine that people don't trust. You need the social sciences to help you find out how best to go about combatting a disease. A new approach we are testing in Wageningen is the use of citizen science. On Muggenradar.nl, where Dutch citizens report bothersome mosquitoes, this has proven a very direct and effective way of communicating and of interesting people. We are now going to try this out in Rwanda, with the aim of pushing back malaria there, and it could be an option for tackling Zika too.'

Sander Koenraadt, entomologist at Wageningen University

Climate change makes mountaineering riskier

Climate change is increasing the likelihood of falling rocks in the Alps and other mountain ranges, increasing the risks for climbers, concludes Arnaud Temme in a study based on old climbing guidebooks.

The warmer climate means that glaciers and snowlines are receding. Rocky slopes that used to be permanently frozen and covered in snow now alternate between freezing and thawing. Cracks and fissures fill up with water, which then freezes and causes the rocks to split and boulders to come loose. The situation will only stabilize again once the area thaws for good. Temme, from Wageningen University, studies how mountainous areas are changing as a result of global warming. Because he is a climber himself, he came up with the idea of looking at climbing guidebooks. He discovered differences between older guides and more modern ones, which suggested changes in the landscape. In climbing guidebooks, professional mountaineers describe dangers such as loose rubble on the routes as well as features of the mountain such as the type of rock and orientation of the strata.

In his study, Temme compared 17 guidebooks written between 1864 and 2010 covering the Bernese Alps, which have a long



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history of Alpine sports. He found that the danger of loose rubble on the 63 routes described in these guides rose gradually from 1950 and then much faster from 2000. Temme: 'Seven routes have even been scrapped because they are too dangerous.' He also shows that there is a greater risk of loose rubble on slopes facing east or west because the temperature fluctuations are greater than on the slopes facing south or north. The danger is also greater on V-shaped slopes (couloirs) and with hard

rock types such as granite and amphibolite. The information in climbing guidebooks provides a valuable context for other data such as satellite recordings and laser measurements of slopes. The fact that mountaineering writers' assessments are subjective does not detract from the conclusion that the danger is increasing, says Temme. Thanks to his research, it is now possible to predict the dangers in a particular area on the basis of its features.
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VOEDSELKETEN



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More food from Ethiopia

Ethiopia has the potential to be a major producer and exporter of agricultural products. To help it realize that potential, a four-year bilateral partnership called BENEFIT started this year with the support of the Dutch Ministry of Foreign Affairs. The 30 million euro programme, which Wageningen UR heads, aims to increase production, improve the availability of

food, and ensure sustainable incomes and trade for over three million smallholders and several thousand cooperatives and smaller companies. The programme will help Dutch and international companies to invest in the agricultural sector and will train Ethiopian researchers and agricultural extension workers.
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HUMAN AND ANIMAL HEALTH

FOREST ECOLOGY



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New antibiotic resistance found in Europe

Bacteria have been found in the Netherlands and several other European countries that are resistant to the antibiotic colistin. In human healthcare, colistin is a last resort in dealing with multi-resistant bacteria.

The investigation followed the discovery in China of a new gene (MCR-1) giving resistance that can be transmitted to other kinds of bacteria. China is one of the major users of colistin, where it is used to tackle *E. coli* infections in poultry and pigs. Scientists have linked this use to the pres-



ence of this form of resistance in humans and in chicken and pork in China. In Dutch livestock farming, the use of polymyxins, which include colistin, has fallen dramatically in recent years.

The Central Veterinary Institute (CVI), part of Wageningen UR, found three resistant strains containing the transferable MCR-1 gene when screening salmonella bacteria in chickens and turkeys. To assess the risk, the CVI is now also testing *E. coli* bacteria from manure samples from broiler chicks, pigs, veal calves and dairy cows.

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Growth rate of trees can be predicted

In a forest, different tree species compete with one another for light, space and nutrients. In January researchers from Wageningen University and international colleagues showed in the scientific journal *Nature* that three functional traits can predict consistently around the world how well trees grow in a forest and the forest dynamics. The wood density in particular is important: lightweight wood species can grow fast in open spaces, but species with dense wood are better able to cope with competition and suppress the growth of neighbouring trees. The leaf surface area (per gram of leaf matter) and the tree's maximum mature height also play a role. Furthermore, light seems to have a bigger impact on competition and growth than nutrients do.

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WAGENINGEN ACADEMY

Summer course Dutch Dairy Chain

The Netherlands is world-famous for its high-quality and efficient dairy production. In an intensive Summer Course, Wageningen Academy surveys Dutch best practices in different parts of the dairy chain, and brings international dairy professionals up to date on the latest insights regarding dairy production from grass to glass. Topics such as genetics, feeding, smart farming, grazing, milk processing and milk product development are

presented by experts from the industry and research.

Programme director: C. (Kees) Lokhorst, MSc, Wageningen University/
Van Hall Larenstein University of Applied Science

Date: 27 June 2016 - 30 June 2016

Location: Dairy Campus, Leeuwarden, the Netherlands

Info: www.wageningenur.nl/en



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Older people tend to like ginger

Older people may have different taste preferences to the young, it appears from an experiment in which subjects aged over 65 and another group aged about 30 sampled the spiced cake that many Dutch people eat at breakfast (standard, wholemeal and ginger) and chocolate (milk, pure and mint). The older subjects gave significantly higher scores than the young for positive emotions such as 'pleasant', 'happy' and 'enthusiastic' on eating both gingerbread and mint chocolate. This information is important in the development of new products.

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TRADE

Agricultural exports continue to grow

Dutch exports of agricultural products continue to grow. LEI Wageningen UR estimated total exports in 2015 at 82.4 billion euros, almost one percent more than in 2014. Germany is still the most important trading partner (25.3 percent). 'Knowledge and innovation remain crucial if we are to maintain our position as the second biggest exporter of agricultural products after the US,' said the state secretary for Economic Affairs Martijn van Dam when the figures were presented.

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PHOTO ARJAN PALSTRA

Adolescent eels refuse to grow up

Eels still fail to reproduce in captivity. But Wageningen UR has managed to breed eels and raise them to puberty.

European eels that have reached reproductive maturity swim to the spawning grounds in the Sargasso Sea, where they reproduce and then die. Researchers from Wageningen UR have managed to simulate this journey of almost 4000 kilometres using a swimming tunnel. To do this, they replicate the conditions for the migrating eels as closely as possible, giving them freshwater first followed by salt water, as well as fluctuating water temperatures as the eels swim at different depths with the associated light conditions. The eels reared by the researchers mature sexually up to the stage that wild eels have reached when they disappear into the ocean. That can be seen from the big increase in the level of testosterone and the growth in the sex organs, the testes and ovaries. However the researchers have not yet been

able to get beyond adolescent eels. It would appear that something else is needed for them to develop to full sexual maturity. The adolescents can be made to attempt to reproduce by giving them a hormone treatment; the eggs are fertilized but no larvae are born. Last autumn, several dozen more reared eels made the virtual journey to the Sargasso Sea in a project in collaboration with the Dutch foundation for a sustainable eel industry (DUPAN) and the Ministry of Economic Affairs. Now the Wageningen scientists are trying to get these adolescent eels to produce larvae that will eventually grow into healthy young eels.

The study is being carried out in Wageningen, which is where all farmed fish research has been concentrated since January.

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ANALYTICAL CHEMISTRY

Chicken feathers betray use of antibiotics

RIKILT Wageningen UR has developed a method that can be used to track down unnecessary or illegal use of antibiotics in the poultry sector. The test is an important tool in the effort to combat bacterial resistance.

You can tell whether a chicken has been treated with antibiotics from its feathers. The type of antibiotic treatment and the stage in the chicken's life at which it was given can be deduced from the position and distribution of an antibiotic in and on the feathers. The medication's 'fingerprint' shows which antibiotic was used. These data can then be compared with the farm's records. This makes it clear whether the antibiotics come from a recorded oral treatment to treat a disease, an unrecorded spray treatment or an illegal, long-term, preventive treatment that has left traces of the medication throughout the feathers. The test can be used on



PHOTO ISTOCK

chickens on the farm or in the abattoir. However at present it is still expensive and time-consuming, so RIKILT is working

on faster, cheaper methods that can be used on site.

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FOOD AND EMOTION

Happy vibes from vanilla yoghurt

Eating vanilla yoghurt makes you happy, according to a study by researchers at Wageningen UR Food & Biobased Research and fellow scientists in Europe that looks at the influence of eating yoghurt on people's emotions. Low-fat yoghurt also induces positive emotions.

In this study, the researchers got three groups of subjects to eat various different yoghurts. During the experiment, the subjects were shown images of other people and asked how those people seemed to them. The subjects assessed the faces according to six positive characteristics and six negative ones, for example 'nice', 'reliable' and 'tense'. The idea behind this method is that people project their own emotions onto others, so that their assessments reveal their own mood. A subject's emotions are not related to whether they liked the taste of the

product, but their mood is affected if the food turns out to be a pleasant surprise or a disappointment.

The unconscious responses can provide food manufacturers with valuable information.

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ENERGY



PHOTO SHUTTERSTOCK

Greenhouses achieve climate targets

CO₂ emissions from greenhouse horticulture fell by 30 percent between 2010 and 2014 thanks to a decrease in the consumption of natural gas. This means that emissions have fallen below the target agreed with the government for 2020. This is clear from LEI Wageningen UR's 25th greenhouse horticulture energy monitor. The decline is structural and is mainly due to a reduction in the area under glass, reduced sales of electricity generated by gas and an increase in the proportional use of sustainable energy. Info: nico.vandervelden@wur.nl



More food with better fertilization of grass

Grasslands around the world should be fertilized with four times as much phosphorus over the next few decades as is usual now. That will improve grass growth, which in turn will allow much higher levels of meat and milk production without needing to feed livestock with large amounts of food crops such as cereals. These conclusions are presented by researchers from Wageningen University, the Netherlands Environmental Assessment Agency, Utrecht University and the FAO in a paper in the scientific journal *Nature Communications*. This would let grasslands play a much bigger part in food production. Grasslands account for two-thirds of the world's agricultural land but are generally not intensively managed, except in north-western Europe.

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Seniors eat more protein thanks to hospital menu

Many elderly patients in hospitals do not consume enough protein, even though this is important in helping them recover. Protein intake can be increased by replacing the standard food on the hospital menu by products with added protein.

This finding comes from research by a PhD candidate at Wageningen UR in the Cater with Care project. She compared two groups of elderly patients in the Gelderse Vallei hospital, which uses an à la carte meal system that lets patients place orders for food at any time of the day. One of the study groups was given the standard menu while the other group had the option of products with added protein, indicated by a 'thumbs up' symbol. The enriched basic

products such as bread, soup, juices and snacks were designed to suit the preferences of the elderly. This enabled elderly patients to get enough protein at each meal without having to eat more, even if they were not very hungry. Only half the patients in the standard group consumed enough, but that increased to 79 percent in the group with the alternative menu.

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PHOTO: HOLLANDESE HOOGTE

Greener surroundings mean less ADHD

Children who grow up in greener surroundings are less likely to take medication for ADHD, such as Ritalin, than children in more urban neighbourhoods. However this relationship only applies to poorer areas. These are the findings of Alterra Wageningen UR based on a health insurer's data on ADHD medication for

children aged between 5 and 12 by postcode combined with data on the presence of a city park, wood or farmland within a radius of 250 metres. The statistical analysis shows no relationship for small-scale greenery such as trees in an avenue, grass verges or gardens.

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TOURISM



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Rumeli fortress, Istanbul, Turkey

Find your ideal holiday destination

If you want an active holiday in Europe and are interested in nature and the countryside, then you should try the district of Vâlcea in Romania, or Venda Nova on the Portuguese coast. For a city trip Istanbul is a nice option.

These results come from an analysis of more than 4200 unique visitors (since 2010) to the myplacetobe.eu website run by Alterra Wageningen UR. More than three-quarters of the visitors were Dutch. Myplacetobe.eu is the European equivalent of the site daarmoetikzijn.nl, which focuses exclusively on the Netherlands and has been in operation for longer. Initiator Martin Goossen from Alterra set up the European site five years ago. Visitors can fill in a wish-list for their favourite kind of holiday destination: mountains or beach, nature or culture, hot or cool etc. Based on these preferences, an individual recommendation is created using publicly available geographical databases. Alterra started myplacetobe.eu and daarmoetikzijn.nl because they provide researchers with a great deal of information about tourism, recreation and preferences for different types of scenery. Policymakers

and people in the tourist industry can use this information. The data also shows the most recommended holiday destinations. For active holiday-makers, the best places are Vâlcea in Romania and the Portuguese *freguesia* (village) of Venda Nova. Goossen admits that these are probably places no-one has ever heard of. 'But they give the closest fit with the preferences that we can take into account.' These two destinations do not score 100 percent. That is not surprising, says Goossen. 'There is no such thing as an ideal setting.' The most varied landscape for someone looking for a beach holiday is the area around Sausset Les Pins near Marseille in France. Tourists who want to combine a city trip with seeing something of the countryside are best off visiting Istanbul in Turkey. Info: martin.goossen@wur.nl

HEALTH

Centre for One Health established

As of 1 February, Wageningen UR, Utrecht University and four university medical centres have been collaborating in the Netherlands Centre for One Health (NCOH). This national alliance focuses on the interdependencies in the health of humans, livestock, wild animals and ecosystems. Collaborative research will be carried out on reducing and preventing resistance to antibiotics, tackling emerging zoonoses, promoting smart, healthy livestock farming and preventing the spread of diseases among wild animals. Info: martin.scholten@wur.nl

NUTRITION

Insects as a source of omega-3

Analyses at Wageningen University show that insects such as mealworms, cockroaches and soldier flies are a source not just of protein but also of fatty acids, including the healthy omega-3 variants. Manufacturers are interested in fatty acids from sustainable sources, for example for food products, animal feed and cosmetics. The insects produce the omega-3 themselves and they can survive on vegetable waste. Info: daylan.tzompasosa@wur.nl



PHOTO HOLLANDSE HOOGTE

Working out what you should eat

What constitutes a healthy diet for one person can be quite the opposite for another. Nutrition researchers are looking for the reasons for these individual differences and their implications for our diets. Ultimately they want to be able to offer consumers personalized dietary advice.

TEXT ASTRID SMIT **ILLUSTRATION** YVONNE KROESE





‘Dear Mrs X, we have just checked your health status using our apps. It would be sensible for you to eat more high-fibre products in the coming months. Your cholesterol level is on the high side and the biodiversity of the microbes in your bowel is less rich than it was six months ago. We recommend you eat at least four slices of wholemeal bread a day, a slice of gingerbread with your coffee, and include mushrooms in your evening meal twice a week. Kind regards, your digital dietician.’ Far-fetched? Well, not entirely. In the Personalized Nutrition and Health programme, research organization TNO and Wageningen UR are working with companies on this kind of future scenario. ‘For the next year we have a budget of two to three million,’ says Liesbeth Luijendijk, Business Development Manager Food Informatics at Food & Biobased Research, part of Wageningen UR. ‘At Wageningen UR that enables 15 to 20 researchers to get to work.’ TNO and Wageningen UR want to assess the health status of individuals using all sorts of portable gadgets such as step counters, heartbeat meters, blood samplers and apps with which people can easily record their sleeping patterns or their daily intake of foods or drinks. The data that are obtained in this way from all the participants in the study are analysed. ‘On the basis of this together with the latest scientific insights, we want to find out whether we can then offer consumers automatically generated personal dietary advice,’ says Luijendijk.

GOOD FOR US

But surely we know what’s good for us? Do we really need those apps and portable equipment to tell us that? Just follow the dietary guidelines published by the Dutch Health Council last year and you can’t go

wrong. Not so, think nutrition scientists. What is healthy or effective for one person does not have to be good for another. Gradually, more and more evidence of this is emerging.

At the end of last year the academic journal *Cell* published an interesting article. Researchers at the Israeli Weizmann Institute registered the daily intake and blood sugar levels of 800 healthy people over a week. And what did they find? People who ate exactly the same breakfast in the morning could have totally different blood sugar levels two hours later. For one person it shot up to dangerous levels, while for another it remained normal. When the researchers correlated the test subjects’ blood sugar levels with the amount of sleep, physical activity, food intake and the composition of the gut microbiota (the new term for gut flora), they found they could predict for each individual how their blood sugar would react to a particular meal. When they then gave a group of people a meal which matched their physiology, their glucose levels improved and the composition of their microbiota changed. The striking finding was that a diet that was good for one person’s blood sugar did not work for another person.

DIFFERENCES ESTABLISHED

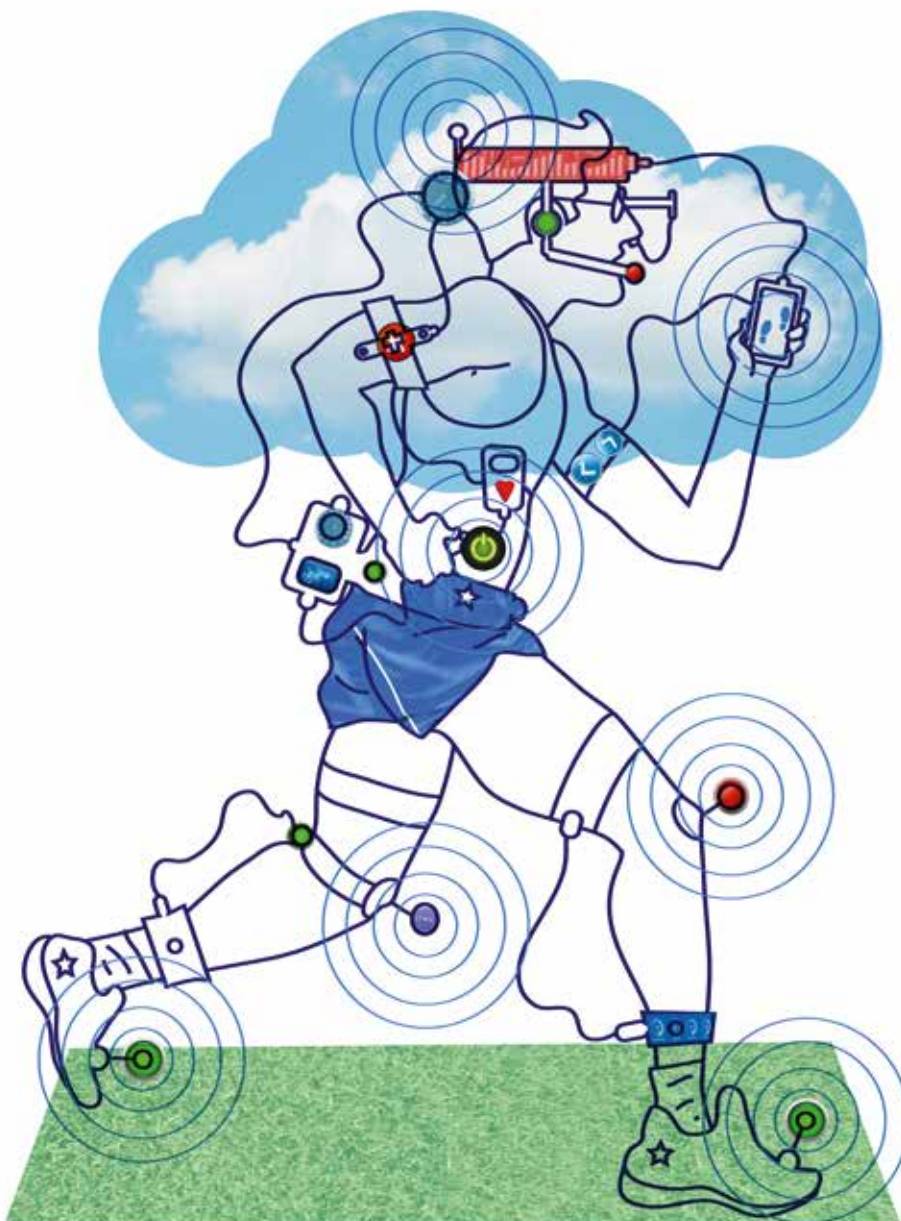
‘This is a very nice study,’ says Edith Feskens, professor of Nutrition and Health over the Lifecourse at Human Nutrition in Wageningen. ‘Never before have the differences been so precisely established for such a large group of people. The study must of course be repeated first to be sure that the results were not coincidental. But if these findings are true, it would seem that there really is a future for personalized nutrition.’ Personalized Nutrition – the idea that indi-

vidual differences exist in dietary needs and that you should bear them in mind to achieve optimal health – has been a buzzword in nutrition studies for a few years now. It has been known since the 1950s that there were individual differences but no one knew how you could make use of them. When human DNA was first decoded in the year 2000, many nutrition scientists thought they had got hold of a good instrument. They speculated about diets that were adjusted to an individual’s specific genes. ‘For example, we expected to be able to predict on the basis of certain genes whose cholesterol would go up,’ explains Feskens, who was working for the Dutch National Institute for Public Health and the Environment (RIVM) at the time. ‘We would be able to prevent that using diet.’ But little came of her study and that of her overseas colleagues. The effects were small, not easily explained, and the results were contradictory. ‘We were working in too limited a way: genes are too static and they only tell you whether a particular protein can be manufactured, not whether that actually happens. Using techniques that measure the activity of genes we can now look at exactly what is happening in the body at a given moment. This will probably help us understand how individual differences come about.’ But she reserves judgement. ‘In the past we promised too much. Let’s wait and see first what comes out of the research,’ says Feskens.

ACTIVE GENES

Lydia Afman is one of the researchers at Human Nutrition who is using these new methods to look for individual differences. She looks at which genes become active when a person consumes a certain food-stuff. Which proteins are formed, where in the body, and what do they tell us about the

‘We are looking for substances which indicate that something is going wrong’



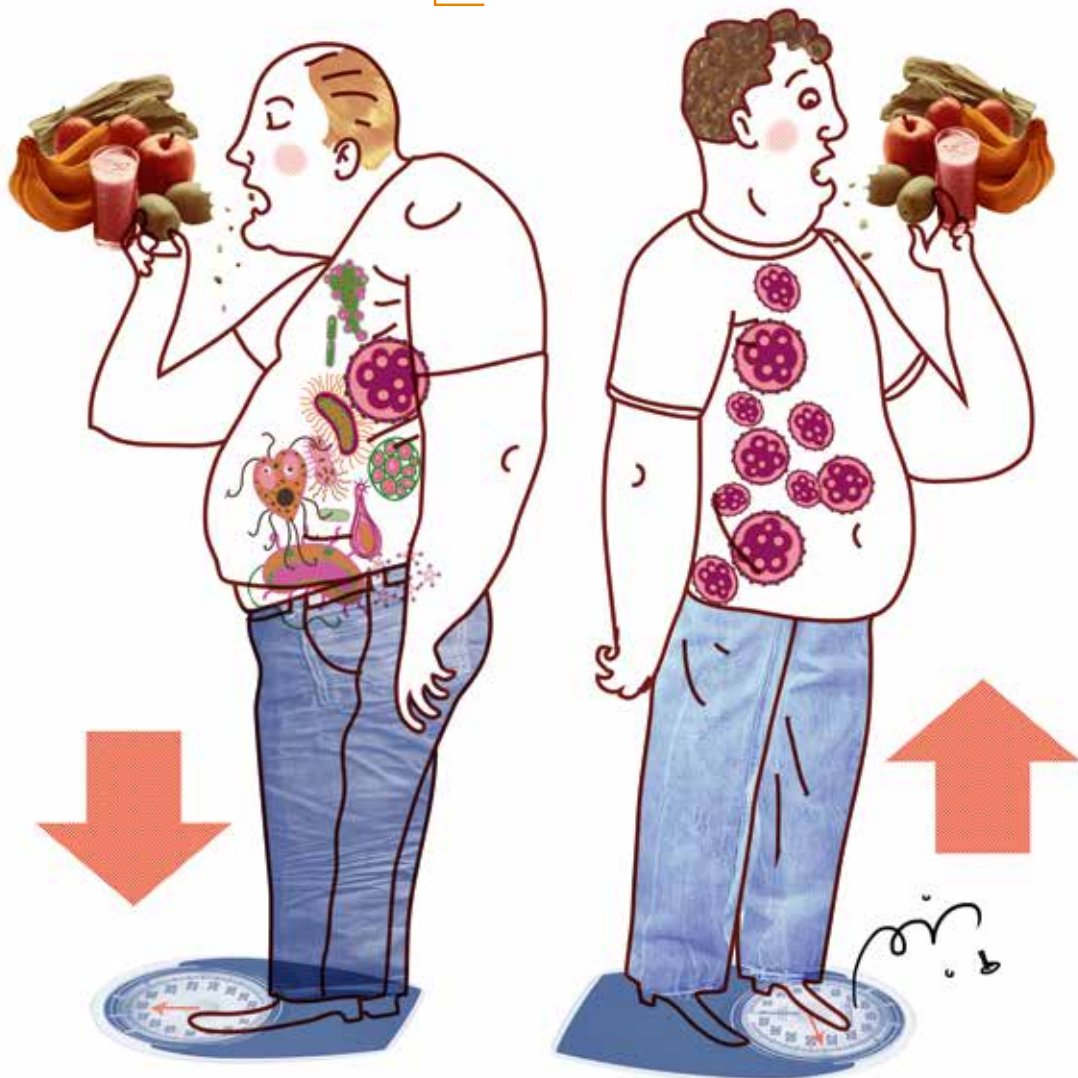
person's physiology? Thin people and fat people, for instance, respond differently to a drink containing dissolved saturated fat, her research group showed in a pilot study. The activity in 600 genes (humans have 20,000) was different in the two groups. And when both groups were given a drink containing monounsaturated fats, as many as 2500 genes responded differently. 'In follow-up studies we shall try to find out what this means,' says Afman. 'We don't just look at the gene activity and the proteins which are formed, but also at the cholesterol level, the glucose level and the blood pressure. By combining and analysing the data from all these factors we hope to gain more insight.'

STRESS TEST

She is doing this in two follow-up studies: the Wageningen Belly Fat project, initiated and implemented by Human Nutrition, and the European Nutritech project. In both projects people have been subjected to a 'challenge', just like the test subjects in the pilot study. Afman: 'We looked at how different people react if they are put under pressure in their diet – a lot of sugars or fats – and through exercise. So it's a kind of stress test.' Subsequently some of the group went on a diet and some did not, after which both groups went through another challenge test. In the Belly Fat project there is more emphasis on organ health than in the Nutritech project. One group, for instance, was put on a diet rich in substances that nutrition scientists believe to have beneficial effects on fat tissue, the liver, heart, blood vessels or bowel.

There are no results yet from either of the projects but Afman is willing to say something about what she hopes to discover. 'We think there is a relation between >

‘Your gut bacteria can determine how you react to a diet’



SMELLING HEALTH

Jurriaan Mes of Food & Biobased Research, one of the Wageningen researchers who will be involved in the Personalized Nutrition and Health (PNH) project, wants to develop a breath test. ‘There are a lot of volatile substances in the breath. Some of them can tell us something about our health, for example whether there is any inflammation in the gastro-intestinal tract. We want to study which substances indicate that and see how we can go from the kinds of large machine we have in our lab to a little gadget that you link to your smartphone.’

He is also trying to link up his EU project Fibeiotics with the PNH programme. In this project he studies whether fibre in foods such as grains or mushrooms reinforce the immune systems of elderly people. Mes: ‘This is seen in tests on cells and lab animals; now we shall study it in elderly people themselves. We shall also try to find out why fibre does have an impact on the immune system in some people and not in others.’ This knowledge can then be used in the dietary advice that consumers can get, based on their health status.

the flexibility of the body – how fast it can absorb sugars and fats, for example, from the blood – and a person's health. The more flexible the healthier. We are looking for substances which indicate that something is going wrong before people are heading for full-blown diabetes or cardiovascular diseases. Then you can change your diet in time. And we hope to find out why some people do respond to a particular diet and others don't.

MICROBES IN THE GUT

It is not just a person's gene activity that determines how they react to their food; the mix of microbes in their gut plays a role in it too. In a 2013 study Wageningen professor of Microbiology Willem de Vos and colleagues of his in England and Finland showed that the gut microbiota of a small group of obese men reacted in different ways when they were first put on a high-starch diet and then on a high-fibre one.

There was a bigger change in the gut microbiota of people with low diversity of microbe species than in those with high diversity. What is more, the people in whom the microbe species changed after eating a high-fibre diet then had healthier cholesterol levels. So the switch to a high-fibre diet was good for them, whereas for the people with a highly diverse gut microbiota the change of diet made little difference. De Vos: 'These findings have been confirmed in other studies.'

A large-scale French study, also done in 2013, showed that obese people whose microbiota consists of many different species benefit more from weight loss than obese people whose microbiota includes few species. In people with high diversity there is a change for the better in certain inflammato-

ry markers – substances in the blood which indicate, in combination with the cholesterol level, whether a person is at risk for cardiovascular disease. 'In people with low diversity this happens to a significantly lesser extent,' says De Vos. 'So the composition of your microbiota can determine how your react to a diet. And in turn, your diet has an effect on the composition of your microbiota.'

DIET FORMULA

The Israeli researchers at the Weizman Institute made use of this knowledge. They related the composition of the microbiota of individuals to what they consumed, their glucose levels, and the amount of sleep and physical exercise they got, and arrived at an algorithm – a formula – with which they could predict which diet would have a beneficial effect on the glucose level in which people. In the Personalized Nutrition and Health (PNH) programme, TNO, Wageningen UR and food companies want to develop this kind of algorithm – but then based on a lot more nutritional and health factors.

'We are trying to establish the relation between all those health elements and diet, as well as to find new links. We then use this as the basis for personal digital dietary advice,' says Liesbeth Luijendijk. Even for already established links between diet and health, she thinks daily tracking of intake and health indicators with apps and portable equipment can be helpful. 'People with high blood pressure know they should be on a low salt diet but they are often unaware of how much salt they consume in a week because they don't monitor it closely and they don't know exactly how much salt products contain.'

TNO and Wageningen UR see an important

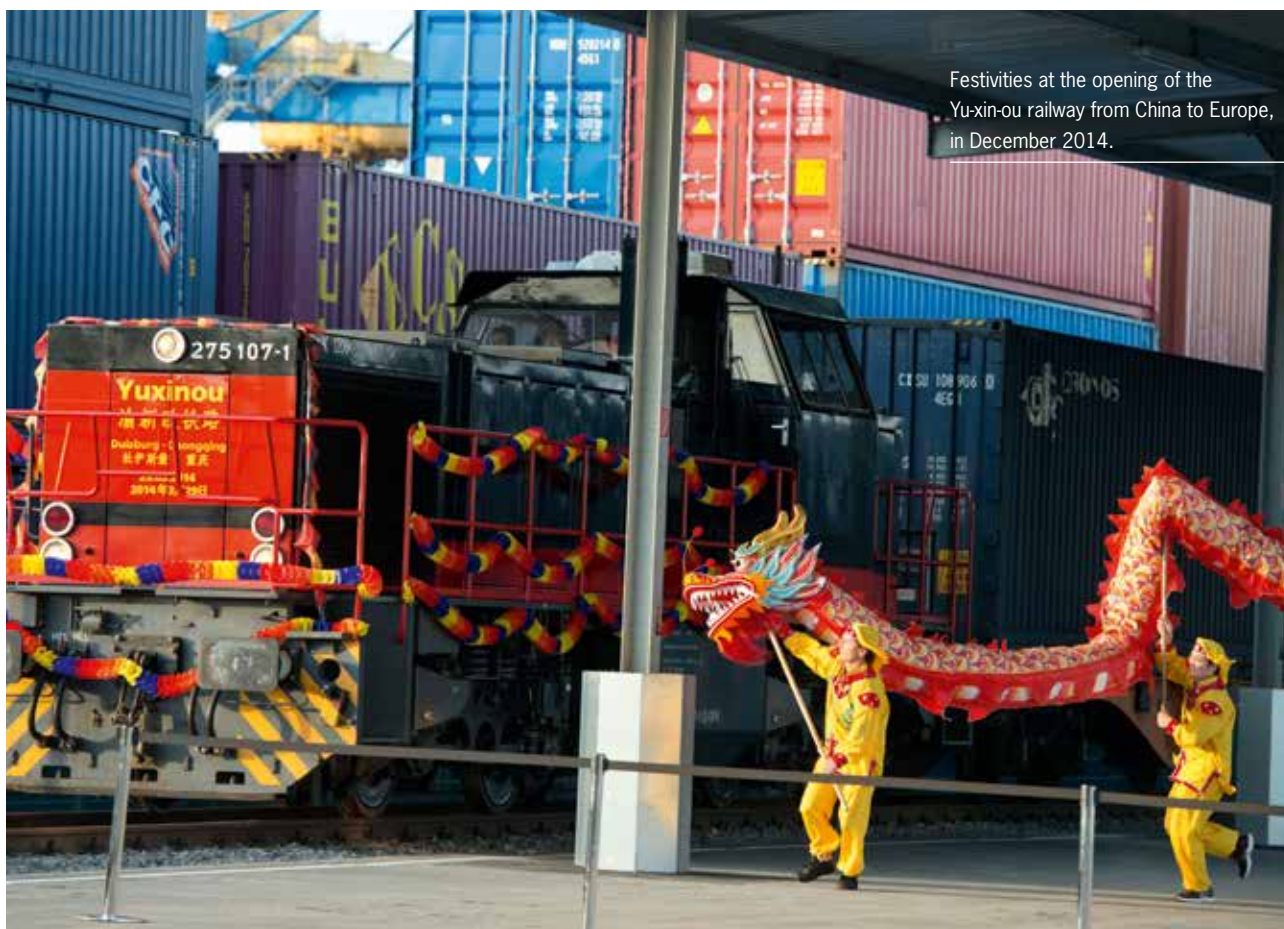
role in the project for the supermarket chains. The consumer logs in at an online supermarket with the digital dietary advice and is told which products fit the bill. Luijendijk: 'If he has high blood pressure, he is offered low salt products or recipes that don't use too much salt. That is in the supermarket's interests as well. They want to sell bulk products such as soft drinks and crisps, but they are also keen on customer loyalty and to go along with the trend for healthy products.'

But will there be consumers who want to work on their health so intensively? Luijendijk: 'We are going to do research on that. In any case we expect to reach a bigger group of consumers than we do now. The consumers who don't go to see a dietician but who would like to improve their health. For them the personal digital advice probably seems more within their reach. And seeing so clearly what a certain food does to their bodies might motivate consumers to monitor their diet better.' ■

WAGENINGEN ACADEMY

Wageningen Academy will run a course on Protein in senior nutrition in April 2016.

The course offers new insights into the effect of protein on intestinal health and muscle mass in older adults. www.wageningenacademy.nl/course_seniorproteins



Railway to China awaits exporters

What a waste, all those trains returning from Europe to China half-empty, thought Xiaoyong Zhang of Wageningen UR. China is such a big market for Dutch dairy produce, vegetables, fruit and flowers. Transporting these goods along the Silk Road is faster than shipping them and cheaper than airfreight.

TEXT ALEXANDRA BRANDERHORST **PHOTO** ANP

Last year a train came from China to Europe on the Yu-xin-ou railway almost every day. The line starts in the fast-growing industrial city of Chongqing and runs through Kazakhstan and Siberia. Most of the trains packed with car parts, instant coffee, electronic goods and laptops are destined for Duisburg in Germany. But no more than half of the containers they carry return to China full.

The train could also continue from Duisburg to other European destinations such as the Dutch port of Rotterdam. What if these trains were to return eastwards carrying Dutch agricultural and horticultural produce? This idea occurred to Xiaoyong Zhang, account manager for China at Wageningen UR and a researcher at agricultural economics institute LEI Wageningen UR, during the opening ceremony for the Yu-xin-ou railway in Chongqing in December 2014. 'China has a big market for dairy produce, flowers, fruit and vegetables. People with good incomes, 5 to 10 percent of the urban population, easily pay twice as much as Europeans for fresh quality products. They'll pay 10 euros for an apple,' says Zhang.

NEW SILK ROAD

The trading routes between China and Europe grew up over 2000 years ago. It was the popularity of Chinese silk in the Roman empire that gave rise to the name Silk Road. The Chinese name is 一带一路, Yi-dai-yi-lu: one belt, one road.

In those days the journey took many months. Now the roughly 11,350-kilometre train journey from Rotterdam to Chongqing takes 13 days. A ship takes five to six weeks. 'The train is one and a half to two times more expensive than the boat and five times cheaper than flying,' calculated Zhang. Chongqing lies centrally in southwest China and forms a transport hub that is ideally placed for distribution in the Chinese interior. Zhang researched the options for train transport from Rotterdam to China and presented her findings at the end of October 2015 to a Dutch trade delegation in China accompanied by the director of the Port of Rotterdam and the mayor of Rotterdam, Ahmed Aboutaleb. Many Dutch companies have shown an interest in this new Silk Road, including dairy company Friesland Campina and vegetable, fruit and dairy exporters such

as The Greenery, Floraholland and Levarht, which currently ships Conference pears to China. They are following developments closely. Zhang: 'A train has already gone from Denmark to Chongqing carrying 40 tons of milk powder. But in the Netherlands we are still waiting for the first person to eat the crab, as the Chinese saying goes.'

The Rabobank is studying the possibilities as well. 'Economic growth in China is currently going more slowly than expected, but is still much greater than in other countries, especially compared with European growth. That is why we are looking for new opportunities for European food products and exporters,' says Paul Bosch, analyst at the Food and Agribusiness Research department at the Rabobank. 'A lot of things have gone wrong with food in China and consumers are suspicious. They often trust imported food more than local products,' he adds.

IMPROVED CLIMATE CONTROL

To maintain the quality of Dutch products such as pears, meat and cheese, improvements would have to be made to the cold storage and transport facilities in China. 'The more is invested in the distribution system, the less food is lost and the lower the prices work out,' says Bosch. There is a role here, he expects, for Dutch logistics companies, which could provide expertise, materials and technologies.

LEI researcher Zhang scrutinized the train route itself as part of her study. Along the way the outdoor temperature can go up to plus 45 degrees Celsius in the summer and down to minus 45 in the winter. 'You can transport laptops at above minus 20 and food between freezer temperatures and plus 8 degrees. So the freight containers you

use must have a reliable and sturdy climate control system. We can only really test that when a company actually wants to transport fresh produce on the Yu-Xin-Ou railway,' explains Xiaoyong Zhang. One tricky obstacle is the EU sanctions against Russia and Russia's counter-sanctions, which currently make it impossible to transport European food products across Russia. There is no problem with permits and customs controls though, says Zhang. 'The Chinese have declared Chongqing a free trade zone for foreign imports. There are no controls en route, only on departure and arrival' This represents a fantastic opportunity, says Zhang, who plans to submit a Top Sector project proposal and funding application to the Dutch ministry of Economic Affairs. 'There is a big demand in China which Dutch food producers and exporters can meet, and they can make a good profit out of it. It would be a pity if they missed the train.' ■

www.wageningenur.nl/agritrain

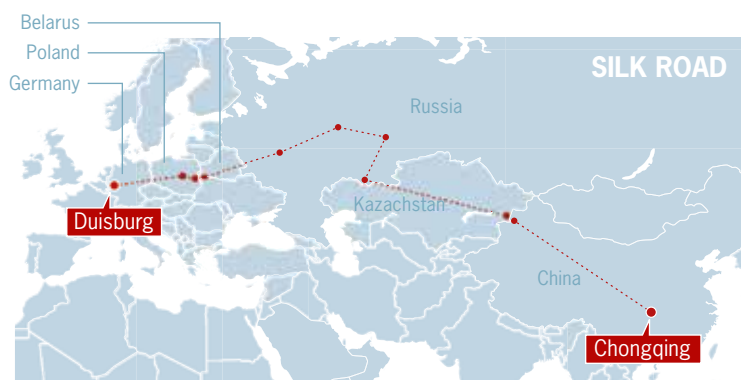
WAGENINGEN ACADEMY

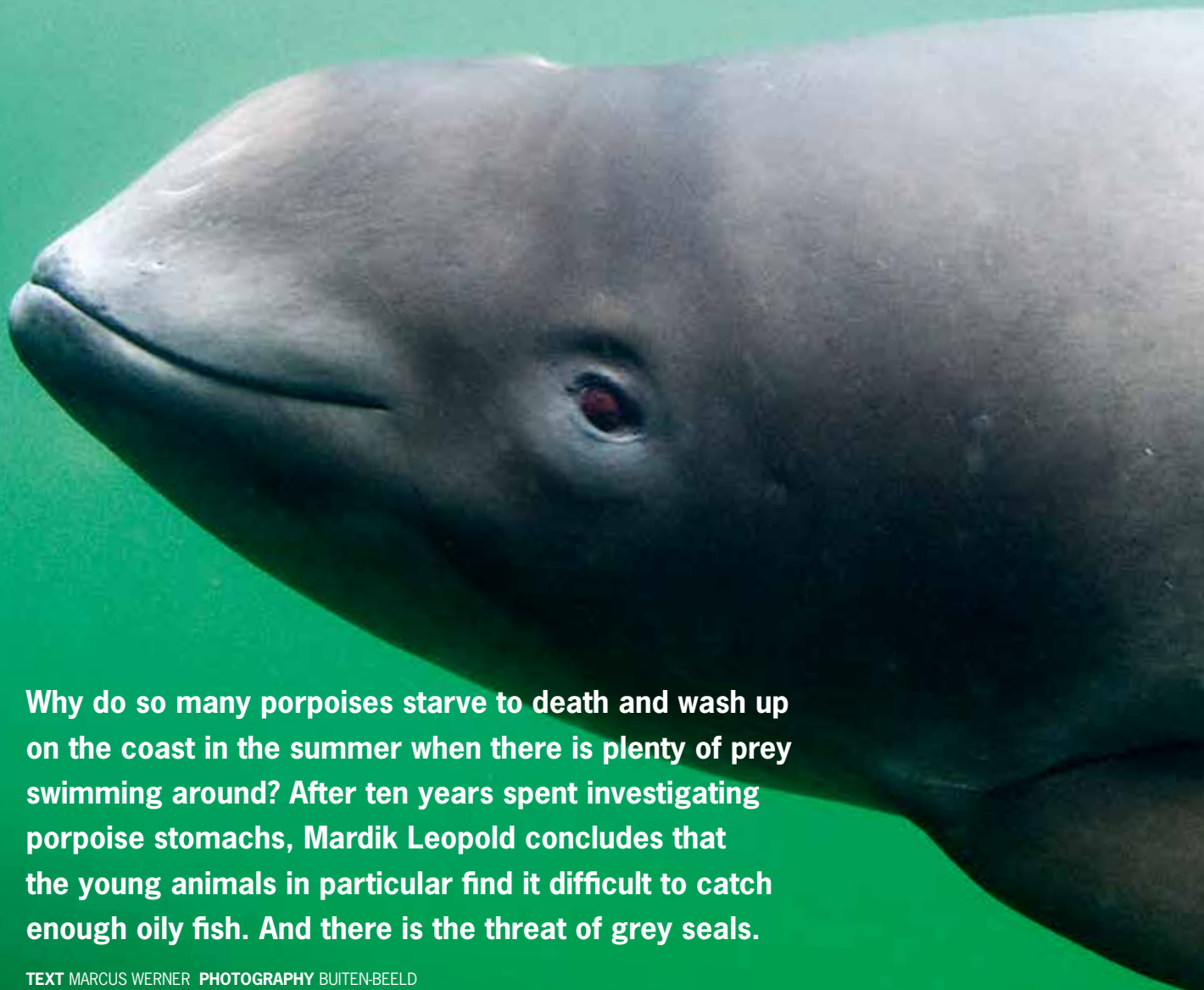
Course China Business

Wageningen Academy course for Dutch Agri&Food companies considering doing business in China. www.wageningenacademy.nl/course_chinabusiness

Post Harvest Technology Courses

Wageningen Academy courses on technologies for handling fresh horticultural products. In Wageningen and in Shanghai. www.wageningenacademy.nl/course_postharvest





Why do so many porpoises starve to death and wash up on the coast in the summer when there is plenty of prey swimming around? After ten years spent investigating porpoise stomachs, Mardik Leopold concludes that the young animals in particular find it difficult to catch enough oily fish. And there is the threat of grey seals.

TEXT MARCUS WERNER PHOTOGRAPHY BUITEN-BEELD

TEN YEARS OF RESEARCH ON THE PORPOISE'S MENU

Porpoises can starve

A large, spotted whale, likely a humpback whale, is shown swimming underwater. The whale's body is covered in dark, irregular spots and streaks on a lighter background. It is moving from left to right, with its head and dorsal fin visible. The water is a clear, deep blue. The whale's tail is visible at the bottom right, and its pectoral fin is partially visible on the left side.

in a sea full of fish

I didn't believe it at first,' says Mardik Leopold. The marine mammal and seabird researcher from IMARES Wageningen UR in Den Helder will not easily forget the time when a fellow researcher told him that porpoises in captivity can die of starvation after as little as three days without food. Leopold spent ten years studying the menu of the harbour porpoise, which is common in the North Sea and one of the world's smallest cetaceans. One of his findings is the discovery why this small mammal needs to eat so much in the wild too. His research helped the Netherlands to meet its EU obligation to collect data on the Dutch population of harbour porpoises, which are a protected species. Leopold also looked at whether the fishing industry and the fish-eating porpoises were in competition. In November 2015, he obtained his doctorate at Wageningen University for this research. In his study, Leopold figured out the porpoise's feeding habits from the stomach contents of dead animals that were washed up on the Dutch coast during the research period. At the same time, he also provided proof for the hypothesis that the mysterious injuries to the porpoises were caused by attacks by hungry grey seals.

STINKING STOMACH CONTENTS

'Investigating stomach contents is an indirect method of studying the choices that the animals make,' says

Leopold, talking in mid-January on the island of Texel. He is in the Royal Netherlands Institute for Sea Research (NIOZ) building, which was where he worked until IMARES' recent move to Den Helder. Leopold used the stomach contents of dead animals to reconstruct which fish species are on the menu of porpoises and in what quantities. Do porpoises differ in their choice of prey according to their age and state of health? Are there seasonal patterns in their diet? These questions were at the heart of Leopold's research. He found the answers in the undigested remains of the prey left in porpoise stomachs, such as otoliths, fish bones and the horny beaks of squid.

The food pulp in a porpoise's stomach does not exactly smell nice. 'But the research is fascinating,' says Leopold. He explains that diet studies usually aggregate the data from individual stomach examinations. 'But that only tells us what the average animal eats.' In this study, veterinary pathologists at Utrecht University carried out autopsies to determine the cause of death and assess the 'nutritional status' of the dead animals, from very well fed to starved. The body length was also recorded. This enabled Leopold to build up a picture of the diet of porpoises in different seasons, different age categories and different states of health.

The study shows that the main prey of porpoises along the Dutch coast are small whiting, young herring,



PHOTO Kees Camphuysen

STOMACH CONTENTS

Mardik Leopold used the stomach contents of dead animals to reconstruct which fish species are on the menu of porpoises and in what quantities. The stomachs contain the undigested remains of their prey such as otoliths and fish bones. Otoliths vary depending on the fish species and grow in size as the fish grows. It is possible to count the number of growth lines under a microscope and so work out the age of a fish. Leopold and his colleagues examined more than 150,000 otoliths from porpoise stomachs.

An opened stomach containing a semi-digested goby and a pulp containing large numbers of fish otoliths.

sprats, the lesser sand eel and gobies. None of these are important commercial species for the Dutch fishing industry. Sole and plaice, which are fished in large numbers, rarely end up in porpoise stomachs.

YOUNG AND STARVED

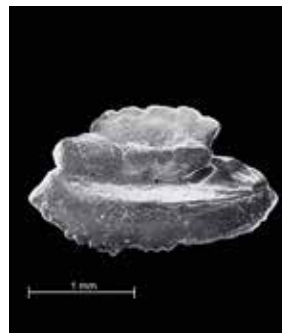
The detailed stomach examinations allowed Leopold to discover why relatively large numbers of young porpoises wash up starved to death in the summer months even though there are plenty of fish in the sea then. According to Leopold, the explanation lies in a biological limitation of this small cetacean species. Warm-blooded animals such as whales require a great deal of energy to maintain their body temperature. The smaller their body, the greater the relative energy requirement because they have a relatively large surface area through which heat is lost. This effect is even stronger in marine mammals because water has such good thermal conductivity and because temperatures are usually lower. Whales have a subcutaneous layer of fat that prevents heat loss to the surrounding water but they still have relatively high energy requirements. Porpoises in captivity need to eat about ten percent of their body-weight in food every day to remain healthy. That is a higher proportion than for other cetacean species, which reflects their smaller size. Leopold concluded on the basis of his research that young porpoises, which are of course even smaller, get into problems in the summer because they are unable to obtain enough energy from their food.

A porpoise's menu includes not only oily, energy-rich fish species such as herring, sprats and the lesser sand eel, but also gobies, which are both very low in fat and relatively small. The whiting on the menu is also low in energy but is relatively large compared to the other species. Small, young porpoises turn out to mainly eat small gobies, sometimes in staggering quantities – the record was almost 5400 gobies in a single stomach. Medium-sized porpoises have far more oily herrings and sand eels in their diet. The largest porpoises eat a great deal of whiting. Leopold: 'You would expect animals to choose the prey that is most beneficial in terms of energy. But young porpoises don't do that.'

EATING JUNK FOOD

According to Leopold, young porpoises are in a kind of energy Catch 22: it appears that because they are young

Young porpoises do not get enough energy from their food



Otoliths

The otoliths in a porpoise's stomach can be used to determine what fish species were eaten, in what quantities and how old the fish were. From left to right: otoliths from a goby, herring, sprat, whiting and lesser sand eel.

PORPOISE COMEBACK

Porpoises had virtually disappeared from the coastal waters around the Netherlands by around 1970. This dolphin-like aquatic mammal with an adult body length of about one-and-a-half metres lives on its own or in small groups in shallow coastal waters in the northern hemisphere. Now large numbers of porpoises can be found swimming in the Dutch part of the North Sea, the Wadden Sea and the Eastern and Western Scheldt estuary. They are among an estimated total population of 300,000 porpoises in the North Sea. The porpoise's distinctive 'rolling' back and dorsal fin are no longer a rare sight at the water's surface, to the delight of nature lovers. Although the quality of the seawater has improved and there is less pressure from fishing, the increase in the number of porpoises in the southern reaches of the North Sea is mainly due to the decline in the lesser sand eel population further north in the North Sea. The lack of food has caused the population in the north to spread to the south. The porpoise population is currently stable according to the most recent North Sea-wide counts.



PHOTO WILDAPHOTO

'Porpoises have to root gobies out one by one'

and inexperienced, they are not yet able to catch prey that swim fast such as herring and sprats, and therefore have to make do with gobies. Leopold suspects that these little fish with an average weight of about one gram are easy to catch. 'We don't know much about the distribution or population density of gobies but that must be the case.' Going by the stomach examinations, the young porpoises were regularly eating a couple of thousand gobies a day. 'That means eating at least one per minute, around the clock.' Gobies live on the ocean floor and do not form schools, 'so the porpoises have to root them out one by one.' Yet even in such huge numbers, gobies do not provide enough energy for young porpoises.

The thin layer of fat in the porpoise carcasses in the summer is further evidence of malnourishment.

Leopold: 'This does give you a chicken-and-egg problem: were the animals starving because they were not eating enough energy-rich fish, or were they not catching enough energy-rich fish because they were in poor condition?'

It seems that as porpoises become older and more experienced, they are better able to bag the faster-swimming herrings, sprats and sand eels — prey that do supply sufficient energy. The whiting consumed by the oldest animals reflect the larger amounts of food required for larger bodies. Indeed, Leopold thinks porpoises represent the smallest size that is biologically possible for a cetacean: 'Porpoises evolved from larger forebears in the whale family. The adaption that gave them a smaller body lets them live in shallow coastal waters that are rich in food. Furthermore, this lets porpoises avoid competition with large toothed whales that easily become stranded — take the sperm whales at the opposite end of the size spectrum that end up on the Dutch North Sea beaches. But this does mean that the porpoise's body is so small when young that energy can

CARCASSES

Leopold examined more than 800 porpoise carcasses. He obtained them through an extensive network of volunteers and people working for organizations that care for aquatic mammals. The 'Acknowledgements' in Leopold's doctoral thesis lists their names, which take up almost an entire page and include people who came across a porpoise while strolling along the beach and reported it. In his research, he collaborated with veterinary pathologists from Utrecht University, who carried out autopsies on the dead porpoises.

The cause of death of the washed-up porpoises can be broken down roughly into fishing bycatches, disease, starvation and attacks by grey seals, each of which accounted for about 20 percent. The cause of death in the remaining 20 percent is still being investigated.



sometimes be a problem.' But Leopold discovered that the porpoise's size also results in another biological risk, as it turns the porpoise itself into prey.

CSI NORTH SEA

Animal lovers and biologists, including Leopold, had been puzzling over the mystery of what was causing the incisions – often horrific injuries – found on the corpses of porpoises washed up since 2006. People thought it might have been fishermen who were trying to cover up for unintentional bycatches of porpoises. The solution to the mystery came with a discovery in 2012 by a Belgian aquatic mammal researcher who compared the wounds on fresh porpoise carcasses to the teeth in museum skeletons of grey seals. There could be no doubt about the match. Leopold was one of the first to hear about the discovery. This prompted him to look again at some of 'his' porpoise carcasses. A DNA specialist from NIOZ was brought into the research team to apply forensic techniques to porpoises for the first time, just like in the

CSI TV series where murders are solved by examining DNA traces. The DNA extracted from the porpoises' injuries turned out to be identical to the DNA of grey seals. Then the injuries were compared with those on other porpoise carcasses. About 17 percent of all dead porpoises turned out to have been attacked by grey seals. Because porpoise carcasses with signs of seal attacks were generally fresh and the stomach examinations showed that the animals had been hunting prey just before they died, Leopold concluded that grey seals were targeting and attacking live porpoises rather than gnawing at animals that were already dead. Leopold: 'Young porpoises are the most likely to be attacked. They are about the same size as a large cod, which is a favourite prey of grey seals. Those young animals represent the future of the porpoise population, so grey seals can have a major impact on the population.' ■

www.wageningenur/porpoises

Landscape shapes the city

The success or failure of big European cities was often closely linked with their location in the landscape. Today trade routes, water, food supply and safety are still crucial, and now there is climate change to contend with as well. It is time to look a hundred years ahead.

TEXT RENÉ DIDDE PHOTO PETER ELENBAAS

When you fly into Schiphol you can see for yourself how its good connections with the sea enabled Amsterdam to develop in the Middle Ages into one of the most important trading cities in the world. Moreover, its low-lying position and the soft soils that sank after the extraction of peat prompted the creation of a network of dykes and canals. This later grew into an excellent transport and trade network between the Dutch cities, facilitating fast export by sea.

‘The landscape played a coincidental but crucial role in the development of the Randstad,’ says Wim Timmermans, main author of *The Rooted City*, an essay about European capital cities and their links with landscapes around them.

The essay makes clear that these major European cities owe their success partly to the surrounding landscape, which offered advantages in terms of transport, trade, food supply and defences. Such advantages enabled certain cities to flourish through the centuries. On the other hand, the value of these landscape characteristics does not always remain the same. ‘If one of more factors change, the growth and prosperity of a city can suddenly stagnate and the city can go into decline,’ says Timmermans.

Durrës, for example, developed into the capital of Albania because of its strategic position with a safe rocky harbour and steep coast. But after two Balkan wars and the First World War, Durrës no longer seemed so unassailable. ‘In 1920 Tirana was given the status of capital,’ says Timmermans. ‘That city lay further inland on a sheltered swampy plain, surrounded by mountains and on two major roads.’

EXTREME WEATHER

Today too, cities are dependent on water, food, trade and defence. But they also struggle with traffic congestion, air pollution and problems that stem in part from their location. Delta cities such as Amsterdam and Venice, for example, are vulnerable to rising sea levels. Accessibility, heat stress and food supply pose problems for plateau cities such as Paris and Athens. Extreme weather, heat stress and flooding threaten mountain cities such as Tirana, Bratislava and Luxembourg. Studying patterns of growth and shrinkage in cities in relation to the landscape can help us analyse new challenges such as climate-related problems and address them before it is too late, Timmermans believes. And time is running out. In London and Sheffield, for instance, key infrastructure for



the economy is located in the valleys of flood-prone rivers. This problem is now acute, while the warning signs have been obvious for decades, notes the author.

HEAT PROBLEMS

Athens is heading for serious problems too, in the opinion of Timmermans and his colleagues. The city lies in an infertile bowl on the Attic peninsular, surrounded on three sides by mountains. Drinking water comes through vulnerable pipelines from two

mountain lakes 100 kilometres away. The city's geomorphology – low-lying, surrounded by hills and sea – causes smog and heat problems in the summer. What should Athens do, given the limitations imposed by the landscape? Relocate the city? 'They should at least think in terms of planning that covers 150 or 200 years,' says Timmermans. The same goes for the Netherlands. 'Even our long-term planning is actually dominated by short-term considerations,' thinks

Timmermans. The ground in the Randstad [the urban belt comprising Amsterdam, Utrecht, Rotterdam and The Hague] will sink further, sea levels are rising and the rivers will bring down more and more water at peak times. 'And yet when it comes to infrastructure we continue to concentrate on the Randstad. We just carry on investing in a tunnel here and talking about a new stretch of motorway there. But something that is an investment in the short or medium term can turn into a disinvestment in the long term. In a couple of hundred years the Randstad as we know it will no longer exist.'

'In a couple of hundred years the Randstad as we know it will no longer exist'

NEW COAST ROAD

Changes Timmermans expects by that time include the need for more space for green energy generation, and above all the more prominent role that will be played by sea level rises and salinization. Predictions are that the sea will be one metre higher in 2100 and will rise by the same amount again in the century after that. 'Then the A58 will be a coast road, as it were, and Schiphol airport will be ringed by dykes and surrounded by the sea. We don't have a crystal ball of course, but it makes no sense to stick our heads in the sand until things go wrong,' says Timmermans. Amsterdam will only have a future if very costly investments are made. So he questions the sense of passively waiting to see what happens. 'As an exercise you could develop a scenario in which you relocate the financial-economic side of Amsterdam to the eastern Netherlands over a period of 100 to 200 years, leaving only the tourist attractions in the same place. It would be sensible to start exploring these kinds of options now.' ■

www.wageningenur.nl/en/rootedcities

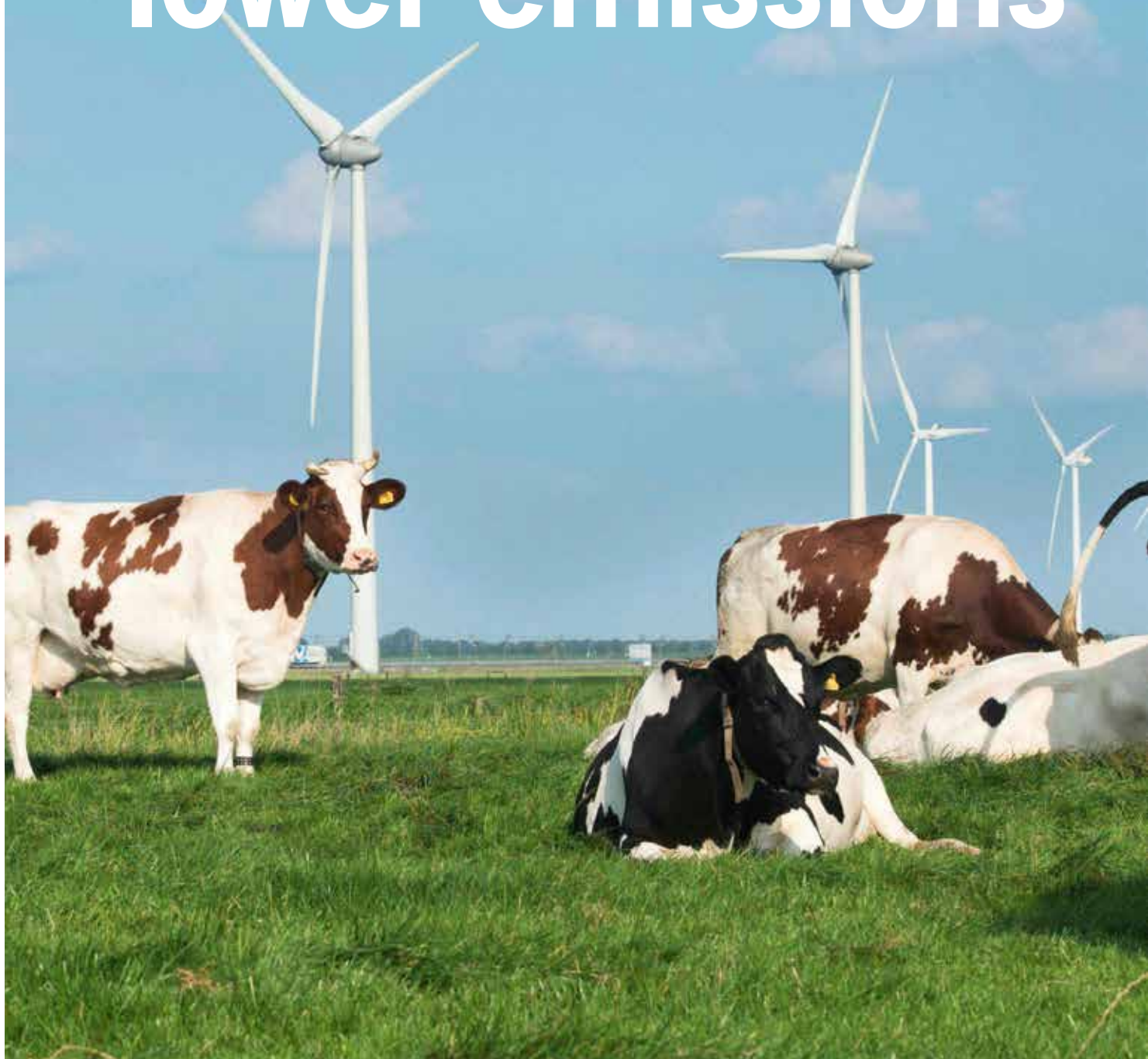
Wim Timmermans et al.: *De gewortelde stad - Europese hoofdsteden en hun verbinding met het landschap / The rooted city - European capitals and their connection with the landscape*
ISBN 978 90 7527 193 5

Its good sea access and its network of dykes and canals enabled Amsterdam to develop into an important trading city.



AGRICULTURE AND FOOD PRODUCTION AFTER PARIS

More food, lower emissions



The climate conference in Paris spelled the end of fossil fuels, says departing professor Pier Vellinga. He hopes that greenhouse gas emissions from agriculture will now be brought down too. Wageningen scientists are already working on this, as well as trying to tackle the effects of climate change. How can we produce enough food in the face of drought, heat and salinization?

TEXT RIK NIJLAND PHOTO HOLLANDSE HOOGTE INFOGRAPHICS PETRA SIEBELINK

There are two prints of Venice hanging on the wall. They still have to be fitted into the overflowing supermarket bag Pier Vellinga has brought to tidy up his office at Alterra with. He visited the Italian city a couple of times a year as a water advisor. The collapsible floodgates being built partly on his advice are due for completion this year.

Vellinga (65), professor and project director of Climate at Alterra, is leaving Wageningen UR just as his work appears to be bearing fruit, and not only in Venice. On the home front, the Grebbedijk between Wageningen and Rhenen will most probably be transformed in the years to come into a climate dyke, a design also known as the unbreachable or multifunctional dyke. This is one of the concepts developed by Vellinga – who trained as a water engineer in Delft – which is gradually gaining ground. The idea is to build dykes which fulfil multiple functions and are not prone to suddenly bursting but at worst overflow slowly.

For eight years Vellinga was one of the leading lights in Wageningen climate research. He devoted himself to scientific research for the IPCC climate panel and for studies on adaptations to climate change in agriculture and water management. He often spoke on these issues in the media, sometimes coming under heavy fire from climate sceptics.

Vellinga sees the climate treaty in Paris as the culmination of these efforts, as he made clear in his valedictory speech – which

coincided with the conference – and in the many lectures which followed it. ‘Things are moving in the right direction,’ he says now in the office he is vacating. ‘The conference in Paris marks the breakthrough for sustainable energy. In Africa it is already cheaper to build wind and solar energy stations than coal- or oil-fired power stations. Okay, it will still take another 30 years before the old power stations are written off but from a technical-economic point of view that problem is solved. In roughly five years’ time no one will be buying petrol-fueled cars.’

GREENHOUSE GAS EMISSIONS

Now that fossil fuels are on the way out, it is high time we tackled the second biggest source of greenhouse gases: agriculture. Agriculture accounts for 20 to 30 percent of the emissions, says Vellinga. This is through its energy consumption, deforestation, the production of artificial fertilizer, the transportation of raw materials, and the emission of methane from cows and irrigated rice cultivation. ‘I hope the climate will now be a source of inspiration for fundamental changes in our agriculture and food system,’ says Vellinga.

Wageningen has traditionally focused on increasing efficiency in agriculture, says the emeritus professor: bigger harvests per hectare with less input, and more animals per square metre. ‘But that is not the way to get greenhouse gases from agriculture under control. What is more, biodiversity is



PIER VELLINGA

Emeritus professor of Climate change, water and safety

'We've got to move towards a more vegetarian lifestyle'



JAN VERHAGEN

Agronomist at Wageningen UR

'I think food security and production come first'

declining fast because of monocultures, even though that intensification does mean you need less land. The problem lies in eating habits based on too much animal protein,' says Vellinga. 'From the problems faced by coal and oil companies, which have lost half their value in a few years, we can learn that only improving efficiency is not enough if the basis is unsound.'

The solution is clear to Vellinga. 'The question must be: how can we produce as much food as possible with a minimum of greenhouse gases. To do this we've got to move towards a more vegetarian lifestyle. The first thing to go is beef, then milk and cheese, then other kinds of meat. For a scientific institution whose mission is healthy people on a healthy planet, there is now a unique opportunity to develop the agriculture and the nutrition of the future. There are plenty of alternatives to animal protein available, and they require less energy, water and space. They are also, if chosen well, healthier for people and planet.'

LOW IN PROTEIN

Agronomist Jan Verhagen of Wageningen UR largely agrees with Vellinga's message. 'Eating less meat and dairy is fine, and good for our health as well,' he says. But to exclude it rigorously would be going too far for him. 'Meat is an important source of protein. In Africa, for instance, the diet is so low in protein that people there can use a bit of meat. In marginal areas, too, cattle are like vacuum cleaners, mopping up nutrients which would otherwise go to waste.' But Verhagen fully supports the idea of Wageningen experts putting their heads together. 'How do we get hold of enough protein in the world? Where are we going to get it from, from plants or from animals – and if so what kinds of animals? Insects, maybe? Or more from the sea? I am all for this kind of exploratory thinking. In Wageningen we are strongly focused on the problems of the present, preoccupied with the status quo. Wageningen needs to be more daring and look further ahead to help shape the future.'



THEUN VELLINGA

Researcher at Wageningen UR Livestock Research

'Even if we become flexitarians, animal production will continue to grow globally'



GERARD VAN DER LINDEN

Abiotic Stress Research group leader at Wageningen UR

'We are breeding for an acceptable yield in less optimal growing conditions'

His colleague Theun Vellinga, a livestock expert at Wageningen UR Livestock Research, sees cutting down on meat as only a partial solution. 'Halving our consumption is fine but even if we in Europe, the US and Australia become flexitarians, animal production will continue to grow globally. The population growth rate in Africa and Asia is massive. Billions of people live there who think: I want to eat meat sometimes too.'

I don't think it's morally justifiable to deny them that. We should focus on food security and making production as sustainable as possible.'

There is much to be gained on both scores, thinks Theun Vellinga. It is ironic, he says, that the more intensive the farming system, the lower the greenhouse gas emissions per kilo of product. This applies to pigs and poultry but especially to cattle, thanks to the production of the greenhouse gas methane in the cow's stomach. 'Our cows eat a lot but they grow fast so you can divide their methane emissions over many litres of milk and kilos of meat. There is a lot of room for improvement in Africa and Asia. With better feed and better management, production there could be doubled without a significant rise in greenhouse gas emissions. I think we should aim for this "sustainable intensification".'

SALINIZATION AND DROUGHT

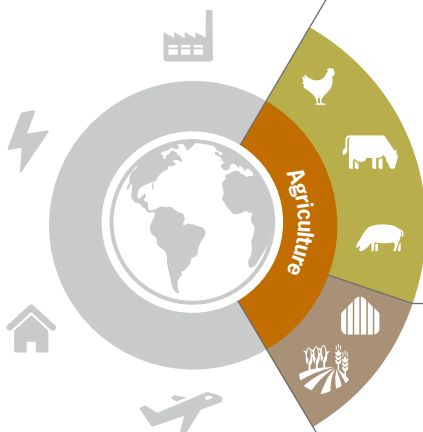
Jan Verhagen would agree that it is not agriculture's chief role to pursue climate mitigation by restricting emissions of greenhouse gases. 'I think food security and production come first. Producing more on the same surface area, and in the process it goes without saying that we must give careful thought to energy consumption and sustainability. Our main role in Wageningen should be on the adaptation side of things: how to deal with the consequences of climate change such as salinization, drought, heat, new diseases and pests, and so on. I think the conference in Paris has clarified the urgency of this in the minds of a broader public and of companies, but much of that research got started in Wageningen ages ago.'

As an example, plant breeder Gerard van der Linden established a research group on Abiotic Stress eight years ago. 'Our crops have been pampered for a long time. It was inexpensive to provide extra nitrogen, for instance, so why would you spend a lot of money on a plant that can cope with less nitrogen? That's a thing of the past now. For environmental reasons you are no longer allowed to use unlimited fertilizer. What is more, the production of artificial fertilizer takes a lot of energy, therefore causing heavy CO₂ emissions. So nowadays we are >

AGRICULTURE AND GREENHOUSE GASES

Various gases are released in agricultural and horticultural processes, especially CO₂ and methane from greenhouse horticulture and livestock farming. Wageningen UR is researching and developing methods of cutting back these emissions.

20-30% of the total global emissions of greenhouse gases come from agriculture



Bringing methane emissions down

In the agriculture sector, cows are by far the biggest source of methane (78%), due to fermentation of feed in the rumen. This could be reduced in various ways:



Adaptations to the feed can bring down methane production by cows. Better manure management can help cut back agricultural emissions too.



In developing countries milk and meat production from cattle could be increased considerably without emissions of greenhouse gas going up significantly.



Alternative protein sources such as algae and insects could help meet the growing demand for protein without the problematic methane emissions from cows. These protein sources also require less energy (therefore causing lower CO₂ emissions), water and space.

Bringing CO₂ emissions down

Most of the CO₂ emissions in Dutch agriculture and horticulture come from the use of fossil fuels in greenhouse horticulture. But there are other areas where savings can be made:



Cutting energy consumption in greenhouses by using sustainable energy and energy-saving measures. Other areas in which savings can be made are: rationalizing transport and logistics in food production, reducing food waste and producing less artificial fertilizer.



Developing new, renewable resources for energy and material as an alternative to fossil fuels. Bio-refinery, for instance, produces chemicals, biofuels and biomaterials, and waste products can fuel power stations.



Preventing CO₂ emissions caused by deforestation for agriculture, and increasing CO₂ absorption by forests through management measures.



2010-2014

MORE CO₂ SEQUESTRATION BY FORESTS

European forests can play an important role in reducing the amount of carbon dioxide in the air. This was the message extraordinary professor of European Forests Gert-Jan Nabuurs drew attention to at the climate conference in Paris last December. His arguments were based on a report he wrote together with colleagues last year. 'Already now European forests absorb 13 percent of the CO₂ emissions from the use of fossil fuels in the EU. This could grow to 20 percent by 2030.'

This would require a very diverse palette of measures, varying per region. The forests of central Europe, for instance, are in need of rejuvenation. In southern Europe,

on the other hand, the focus needs to be on using wood as the basis for bio-products such as viscose and vanilla. 'That gives forests an economic role which prompts people to invest in them and do more to protect the forest against fire, for example,' predicts Nabuurs. By contrast, in northern Europe it would be better to stop exploiting forests for paper production on peat soils. The oxidation of the drained soils releases large amounts of CO₂ into the air. 'I think our report led to the term 'sustainable forest management' being used in the treaty text, but we'll have to wait and see whether that will be followed by substantial measures.'

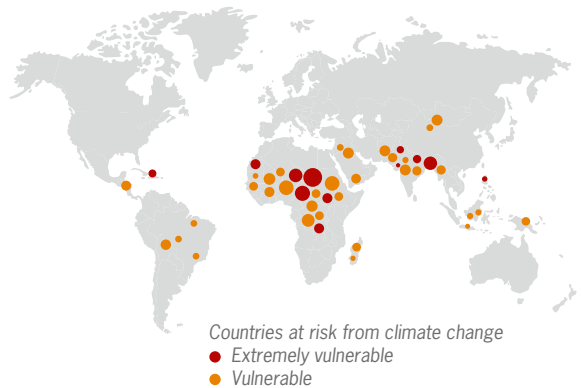
CLIMATE AND FOOD PRODUCTION

breeding plants with other purposes in mind: we don't aim for the highest possible yield but for an acceptable yield in less optimal growing conditions.' Van der Linden focuses on crops affected by climate change through drought, salinization and excessively high temperatures. 'The plant-breeding companies are becoming more and more interested in this, partly because they seek to promote their varieties in countries such as India and China where the growing conditions are often not ideal.'

Work is going on in collaboration with companies to develop a potato for the Dutch market which can survive on less water, says Van der Linden. 'We are also doing research on barley, a model plant that is more resistant to salt than wheat. Unfortunately barley is not an interesting grain for the Netherlands, which makes it difficult to get funding for the research.' He is also focusing on an alternative crop, quinoa. 'That plant even goes on being productive if it is flooded with seawater. I know there is interest in introducing this crop in Vietnam, China and the coastal zones of Saudi Arabia. We are studying the feasibility of this, and what improvements can be made to the quinoa varieties we have developed.'

But the ambitions go further than this. Climate change means not just that plants will have to be more stress-resistant but also

All around the world agriculture is suffering from the effects of climate change. Wageningen UR is working on production methods which can keep food production up under changing conditions such as heat, drought and salinization.



Adapting crops to climate change

Plant breeders are working on crops that can produce adequate harvests under sub-optimal growing conditions.



Potato - which can cope with less water



Quinoa - which can withstand low and high temperatures, drought and salt



Barley - which copes better than wheat under saline conditions

that they will be exposed to pathogens that adapt. 'We are more susceptible to illness when we are under stress, and it is no different for plants. The question is: can we develop resistant varieties that are robust in the face of various different conditions?'

Eddy Moors, extraordinary professor at VU University Amsterdam and head of the Climate Change and Adaptive Land and Water Management department at Alterra, has a dream too. He is very keen to get better input for crop growth models which give an

MONITORING EMISSIONS

'Experience teaches us that states which voluntarily commit themselves to an international agreement do not always do their best to comply,' says Sylvia Karlsson-Vinkhuyzen of the Public Administration and Policy Group at Wageningen University. She is studying the way states are held to account for the implementation of international environmental legislation. The agreements made in Paris for checking whether countries really do take action were vague, she says, and lack sufficient mechanisms for ensuring transparency. 'This makes it very important for scientists and civil society to monitor what states do and hold them to account.'

Countries themselves report on whether their greenhouse gas emissions are really going down. It is difficult to check up on that. Eddy Moors' group at Alterra and the Meteorology and Air Quality chair group are involved in the Integrated Carbon Observation System (ICOS) which monitors emissions and absorption of greenhouse gases in Europe. 'Using measurements and flow models we can establish whether the data countries submit are correct,' says Moors. 'We have an advisory role for national governments and the European Commission. ICOS is the only body in Europe that can do this, but every year it is a challenge to get funding.'

impression of how climate change affects crop farming on a global scale. 'These are often still based on data and models created by De Wit and Goudriaan in the 1970s. Their research on the potential of crops was done when there were much lower concentrations of CO₂ in the air, and with a smaller temperature range. Although there is already work going on in Wageningen, we still have a lot of catching up to do in that area.'

Moors did not hang out the flag when the negotiators in Paris reached an agreement. 'Let's wait and see how many countries really do sign the agreement next spring. And remember that it will take 50 years before the effects are visible.' So climate adaptation will remain a hot item, he predicts. 'It would be good,' he says, 'if we paid more attention to food security in increasingly dry conditions, to rising sea levels, especially in urbanized deltas, and to the problems of heat in urban areas.' He himself is involved in making San Francisco 'climate-proof', and his department is also doing research in the Netherlands on adaptations in urban areas to enable them to cope with heat and torrential rain. 'I would like to shift towards evaluating the effectiveness of various measures, such as applying heat-reflective paint or planting vegetation that provides cooling through evaporation and shade.'

FROM VILLAGE TO CATCHMENT AREA

There is global demand for Dutch expertise in the field of climate adaptation, notes Moors. He believes this to be related to the long Dutch tradition of dealing with water safety issues, as well as to the knowledge that has been acquired in the fields of water supply, drought and salinization in large-scale research projects such as Knowledge for Climate, which was led by Pier Vellinga. 'Thanks to all the expertise we can show what kind of impact climate change has at village level, as well as integrating those local problems and the measures to address them in a comprehensive policy – for an entire catchment are for instance.'

As an example, Alterra is working on revealing what climate change is doing in south



EDDY MOORS

Head of Climate Change and Adaptive Land and Water Management at Alterra, extraordinary professor of Water and Climate at VU University Amsterdam

'In Africa it is difficult to switch to climate-smart agriculture'



ERIK VAN SEVENTER

Manager at Wageningen UR Food & Biobased Research

'Actually we should clean up the greenhouse gases too'

Asia, from the Himalaya to the Ganges delta, a region in which hundreds of millions of people are dependent on agriculture and access to water, while also facing frequent flooding. The institute is involved too in drawing up a delta plan for Bangladesh. According to Moors, all development plans should be drawn up with climate change in mind. 'In Africa for instance it proves difficult to switch to climate-smart agriculture. It is still hard work to convince aid organizations and governments, but, to give an example, there is not much point in making plans for

agriculture only to discover later that due to climate change there is not enough water available.'

Alongside adaptation to climate change, the approach of mitigation – or preventing emissions – is another growing field in Wageningen UR which should receive a boost from 'Paris', expects Erik van Seventer, manager at Wageningen UR Food & Biobased Research. 'It is a good signal that China and the US support this agreement,' he says. 'Companies have been pushing for uniform legislation for a long time.' 'Paris is positive for our research on a biobased economy, too: use renewable resources instead of fossil fuels, which will bring emissions of CO₂ right down. We want to manufacture biobased chemicals, biofuels and materials from biomass – whether that is verge grass, beet leaves, used cooking fat or wood. By using biorefinery we get everything out that we can convert into valuable products. What is left over can fuel a power station.'

Van Seventer would like to see Wageningen taking the lead in the development of a yardstick for assessing the sustainability of manufacturing processes and the use of waste products. 'I think we should lay down as solid a scientific basis as possible for a reliable yardstick. The result of a life cycle analysis, in which you assess the environmental impact of a product from the cradle to the grave, is currently still too dependent on the weightings you use. People just fill those in as they see fit, and they should be standardized.'

Cutting greenhouse gas emissions is too small a step really, in Seventer's opinion. 'Politically speaking, the closed agreement is a marvelous feat. Paris is a good start. But now people are acting as if we ought to be very pleased with less deterioration. It's as though a company that makes less of a loss next year is suddenly declared healthy. Actually we should clean up our atmospheric pollution, the greenhouse gases, as well. That could be the next step.' ■

www.wageningenur.nl/climatechange

Pallets made of coconut waste



Entrepreneur Michiel Vos plans to make transport pallets out of coconut husks. He expects them to be cheaper and more sustainable than traditional wooden pallets. Coconut farmers will share the benefits.

TEXT HANS WOLKERS PHOTOS SHUTTERSTOCK AND COCOPALLET

‘The use of coconut pallets helps reduce deforestation’



Worldwide billions of coconuts are harvested every year for their flesh and milk. The husk of the nut is usually discarded. But it can be used as the raw material for hardboard, discovered Professor Jan van Dam and researcher Edwin Keijzers of Food & Biobased Research, part of Wageningen UR, together with partners from the Philippines. ‘The husks contain a lot of lignin as well as fibre,’ explains Keijzers. ‘If milled husks are pressed at a high temperature and the right humidity level, the lignin reacts with the fibre and everything sticks together.’ After it cools down you are left with strong board with has all the characteristics of MDF board, and yet is more sustainable and is made without glue. This brings the costs of the coconut board down by more than 30 percent compared with those of similar board made of wood or bamboo.

MAKING PALLETS

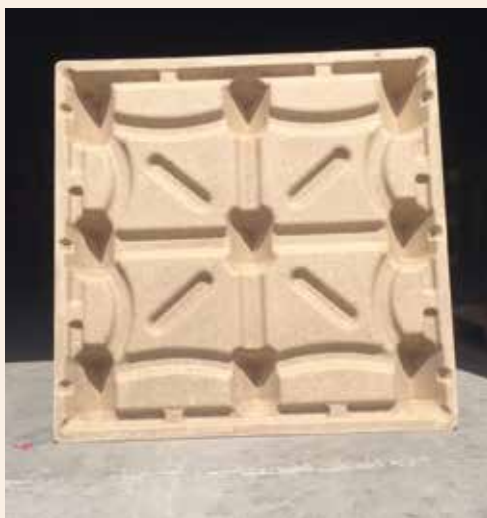
Entrepreneur Michiel Vos, cofounder of the company CocoPallet BV, used the Wageningen technique in his company to press the coconut husks, not to make board but to make transport pallets. This meets a real need, says Vos, because the pallet industry bears some of the responsibility for deforestation. ‘Every year worldwide more than four billion disposable pallets are assembled, often from illegally felled wood,’ he says. In November CocoPallet won the Heineken Award as well as the Accenture

Innovation Award for the sustainable pallet. Vos foresees a bright future for the coconut pallets. The first production facility in south-east Asia will be ready in 2016. That is good news for the local coconut farmers too, says Vos. They benefit from the new added value of the husks. Vos: ‘I estimate that farmers in Indonesia can increase their income from coconuts by 50 to 100 percent.’ But companies stand to benefit from using the new pallets too. Besides the lower purchasing price, there will also be big savings because the coconut pallets do not have to be inspected for destructive insects in the importing country. The user will also make space savings of about 70 percent on the return journey and in storage because empty coconut pallets are efficiently stackable.

REDUCING LOGGING

But it is the environment that stands to gain the most from the biobased pallets. According to Vos, the fact that the pallets are produced locally makes their CO₂ footprint much lower. The biggest benefit, however, lies in the reduction in logging. ‘If companies start using the coconut pallets on a large scale, that will mean a huge reduction in logging,’ claims Vos. ‘But we can only achieve that if we stimulate demand for our pallets with a low price: price is the best motivator for implementing change.’ ■

www.wageningenur.nl/en/biobased-economy



New customers on the farm

These days, one in five Dutch farms combines agriculture with a care function, a campsite or a shop. But you need entrepreneurial flair to earn a decent living this way. 'You need to be permanently offering a quality product, have good communication skills, a strategic vision and to be good at organizing.'

TEXT MARION DE BOO PHOTO HOLLANDSE HOOGTE INFOGRAPHIC STEFFIE PADMOS





A cockerel crows in the farmyard, which smells of cows. In the high-ceilinged, spacious barn, a flock of sparrows skims past while a bantam cock pecks at grains. Cattle with curly coats and curved horns stand, contentedly chewing on their hay and maize. 'These are Italian Marchigiana beef cattle,' says Tineke van den Berg from city farm De Stadsboerderij in Almere. 'In the summer they're kept outside in the Hulkensteinse wood. We chose this breed because they are friendly, healthy animals that never have problems calving. On top of that, the meat has a low cholesterol level.' The city farm combines arable farming, market gardening, livestock farming and a public function. People from the surrounding modern housing estates can come here to learn about organic farming. Tineke van den Berg and her husband Tom Saat have been putting on educational programmes for schoolchildren, students and others for 20 years now, for example about healthy eating and the role of farms in the food cycle. They have cooking classes ranging from 'cooking in student digs' to Indian vegetarian food, a butcher's shop and a farmer's market on Saturday mornings ('Everything that's good for you. The food here tastes so intense!'). The barn that contains the farm machinery is sometimes used for theatrical or musical performances. The city farmers also generate electricity through solar panels and a geothermal heat pump.

SOCIAL ENGAGEMENT

'Our mixed farm certainly earns us enough to live off,' says Van den Berg. 'We do the activities for the general public as well because we are socially engaged. When we came here in 1996, we saw a big divide between farmers and consumers. The people of Almere were focused on Amsterdam and knew nothing about the farmers in the Flevopolder, who in turn ignored Almere. We saw a challenge there. City dwellers basically have no idea what goes on in livestock farming. If the cows are indoors, they ask why they are not roaming outdoors. And if the animals are kept outside, people start getting worried that they will be sent off to slaughter. City types are also always feeling sorry for the animals – even though they are not usually vegetarians themselves.' This city farm is not unusual in modern-day agriculture and horticulture. According to Andries Visser, senior

researcher on urban-rural relations at Wageningen UR in Lelystad, there has been rapid growth in the multifunctional agriculture sector, in which farmers combine agricultural production with services to the community. 'One in five farmers starts up additional activities and looks for new markets,' says Visser. 'They start a farm shop or campsite, establish a rural kindergarten or go into the care sector for former drug addicts or elderly people with dementia, for instance.' Visser says that the sector is becoming increasingly professional. 'The number of businesses is increasing and the products and services they offer are continuously improving too. The farming itself remains a fully-fledged business activity. Using that as the basis, a farmer can then make money from things like healthy regional products, and space, peace and quiet.'

Visser spent the past three years as the programme manager of a major public-private partnership project between Wageningen UR and the Dutch Federation of Agriculture and Horticulture (LTO), aimed at encouraging multifunctional agriculture. About 60 reports and brochures were produced with the aim of giving multifunctional farmers practical tips and inspiration (see box).

END TO EXPONENTIAL GROWTH

In 2013, multifunctional farms achieved a combined turnover of 491 million euros from agricultural production plus secondary activities. The sector grew by 60 percent between 2007 and 2013. The turnover in multifunctional agriculture even grew between 2011 and 2013, despite the economic crisis. Farm shops saw sales rise by 20 percent during this period while kindergartens actually recorded a 30 percent increase.

'But the days of exponential growth are over,' says programme manager Visser. 'Businesses combining farming and care functions or kindergartens in particular are still focused on expanding the scale of activities and becoming more professional. However, grants for agricultural nature management have been restricted and are now only available for farmers in designated core areas. The farm recreation sector and other branches have more or less stabilized. That is quite an achievement now that we are seeing a decline in the number of farmers in traditional agriculture.'

Even so, the researchers still see huge potential for multifunctional farms. They can develop their own markets to a far greater extent than in traditional agriculture. Visser: 'As a business owner, you need to be proactive and seek out new target groups. Know your customer: what do my customers want and how can I key into that? For example, in the recreation sector we are seeing a trend towards increasingly luxurious accommodation. A creative business person could enrich the tourist experience.'

'We care here for plants,
animals and people'



There is plenty of useful work to be done on a care farm, such as harvesting potatoes, feeding cows and cleaning eggs.

rience. You could have a Van Gogh farm, where you can harvest potatoes and have photos taken of yourself dressed like the *Potato Eaters*. And then go outside to paint your own picture of the Dutch skies. You can come up with more ideas than just the standard farmer's-lunch-with-buttermilk approach.'

CROWDFUNDING

In the public-private partnership project, the researchers studied the different entrepreneurial styles. Some multi-functional farmers have six or seven activities on the go in addition to the farm itself while others specialize in a single activity. Their motivations range from a rational choice to more idealistic reasons. Some make big investments based on a clear vision for the future while others work very hard and earn little. Customer engagement also varies considerably; some come along just occasionally to buy a bit of cheese while others almost feel they co-run the business.

Crowdfunding, for example for a new flock of sheep or free-range pig barn, is on the rise and an interesting option — if only because it is a way for the farmer to attract a group of loyal, long-term customers. About 1450 farms have their own shops, often on the farm. Some farmers who make their own cheese jointly rent a small shop with paid staff in a local town, and then use this to attract new urban customers to their own farm with its farm shop or other activities for the general public. The researchers have calculated that it is all right for a self-produced regional product to be up to eight percent more expensive than standard products as long as the quality is right and there is a decent story attached. 'You need a good idea of your core values and how to get that message across,' says Visser.

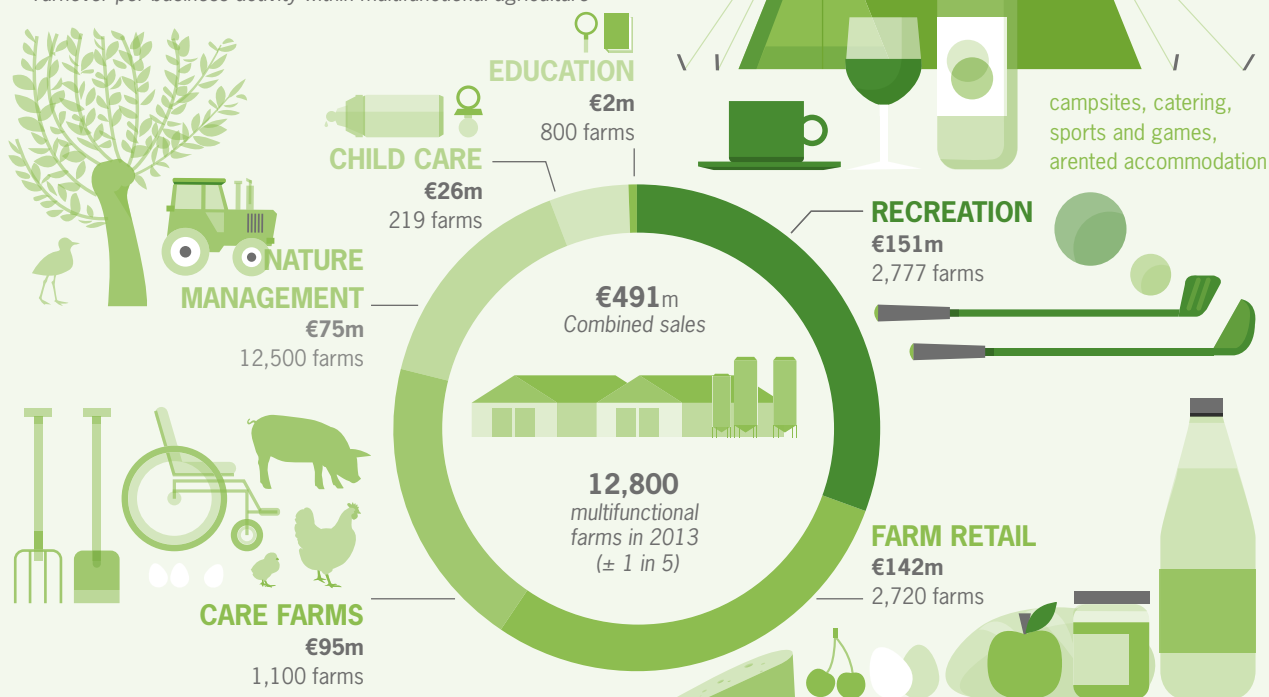
Care farms are also found in all shapes and sizes. The simplest form is when a farmer rents out space to a therapist, for example a physiotherapist who uses docile horses and ponies to improve the motor skills and posture of children with motor problems. Some care farmers are trained psychologists or psychiatrists themselves and offer therapy on the farm. Then there are farmers who hire an entire network of speech therapists, physiotherapists and remedial teachers. 'There are definitely opportunities, including financial ones,' says Visser. 'But it does need to be something that suits the farmer, his private circumstances and his farm.'

FEELING USEFUL

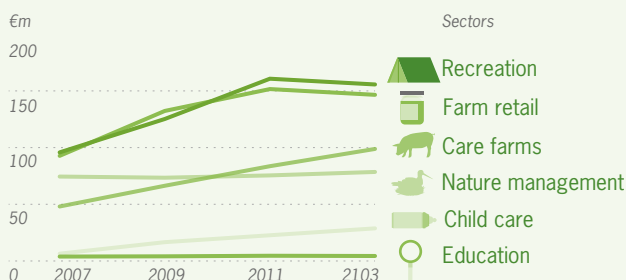
IJsbrand and Caroline Snoeij, who run the organic farm 't Paradijs in Barneveld, employ 20 staff, the equivalent of 12 full-time jobs, plus a group of volunteers. 'We have been running our care farm for ten years now,' says IJsbrand, while a red-coated cow moos gently ➤

MULTIFUNCTIONAL AGRICULTURE IN THE NETHERLANDS

Turnover per business activity within multifunctional agriculture



Turnover per year



Recreation turnover up, farm retail down

The number of farms offering recreation fell by about 4% between 2011 and 2013, mainly due to a decline in the number of farms. Turnover fell too as a result, an effect augmented by the economic crisis and strong competition.

The fall in turnover in farm retail statistics between 2011 and 2013 is due to the fact that the (growing) sales via third-party websites are no longer included. The turnover from farm shops themselves rose too, from 89 to 118 million euros.

in the background. 'A farm is far less off-putting than a care institution. People like coming here. They love seeing the animals and we have fantastic surroundings. What is more, there is always lots of work for them. Looking after the animals, growing the vegetables and fruit, cleaning the eggs, helping out in the shop where they can sell the products they produced themselves. People get a lot of satisfaction from the fact that they can actually do something useful rather than just being kept busy.' Wageningen UR worked with pioneers in the field to determine the added value from care farms. 'The study gave a good picture of the core values and the beneficial effects of care farming,' said Snoeijs. That includes the

skills children learn on the farm. 'A solitary child will learn how to cooperate with others on the farm,' says Snoeijs. 'You need one another. You learn how to look after the animals, who to approach if something's wrong with an animal and how to solve that problem. What's more, animals reflect your behaviour. If a child rides a horse and takes hold of the reins, they feel literally in control of their own life. If you pull to the left, the horse will go left. Here you learn that you need to sow seeds before you can harvest the produce, a good metaphor for life. The elderly also flourish here, while their caregivers get a break at home.'

The Wageningen researchers compiled an overview of

what you have to do to be able to offer a professional, certified, safe learning environment. Snoeij: 'You have to satisfy a variety of quality requirements, the work has to be safe and it must be well organized. You have to hire professionals who know about things like dementia and autism. But all that knowledge should not stand in the way of day-to-day practice. After all, the great thing about a farm is its real-life feel. People can sometimes benefit a lot from ordinary people and ordinary things. And farmers are caring people by nature. We care here for plants, animals and people.'

PROFESSIONALIZATION

Harold van der Meulen from LEI Wageningen UR conducted a study last year of key economic indicators in care farming. 'We see a steady increase in professionalism. Of course some entrepreneurs drop out at the lower end but we are also getting large businesses with numerous professional employees. You see a lot of variety. Sometimes one of the children in the family business will continue the farming side while other family members focus on the care activities, for instance. In other cases, they cut back on the farming activities and intensify the other activities.'

Van der Meulen thinks it is important that Wageningen UR's project has given multifunctional farmers practical tools for taking a more critical look at their commercial results and sparring with colleagues about the figures. In addition to the type of businessperson, the location and business category are the key factors determining how a farm develops. Farms close to a town or city have a huge potential market for farm shops, a care function or a kindergarten. If they are located in the middle of nowhere, the opportunities lie in marketing such selling points as space, peace and quiet. If your farm is a lot of work, you have less time for your customers. An intensive pig farm where the focus is on managing costs and where the barns are closed off has less appeal for the public. Multifunctional agriculture is not a strategy for winding down the farm – on the contrary. Visser: 'You need an awful lot of entrepreneurial flair to earn a decent living. In addition to the technical production side, you need to know your customers and the market, which is often volatile. You need to be offering a quality product at all times, have good communication skills, a strategic vision and to be good at organizing. Some large care farms have a turnover in the millions of euros and provide jobs for 20 or so employees whereas traditional arable farmers may be able to run the farm as one part-time job. Sometimes the turnover from the ancillary activities is even more than from the production side. But a healthy agricultural business remains the basis. The key thing is still: know your customer. Know your

'Know your market and imagine how a city-dweller sees things'

market. Don't rely too much on your own preferences as a farmer; imagine how a city dweller sees things. Be willing to charge the right price – you are offering city dwellers a unique product. And know yourself! You need to know both what you're good at and what you would be better not tackling.'

MUCH APPRECIATED

Tineke van den Berg from Almere for example would never opt for a recreational ancillary business with 'farmer's golf' and similar games, or for a restaurant on the farm. 'That's not my thing. But I do find education important. You can't earn a living from it but you get a lot of appreciation. I think it is important to invest in people. We can live off the abundant produce from our farm thanks to the people who are willing to buy our products. In exchange for that, we want to give the city something in return.' ■

www.wageningenur.nl/multifunctionalagriculture

MORE INFORMATION?

The PPP project 'Multifunctional Agriculture' has produced about 60 reports and brochures. They have been collated in a handy digital list of publications, which is still being added to. Publications such as *Finding and keeping guests* and *Crowdfunding on the farm* offer assistance when dealing with practical problems. The brochure *Successful cooperation in multifunctional family businesses* discusses such issues as mixing private and business matters, involvement and commitment, pitfalls and rules of thumb for communication. *The ideal farm shop* discusses customers, formulas, assortments and the shop layout. A smart business owner will make sure that customers get a positive impression as soon as they cross the threshold. Nine times out of ten, a customer will then turn to the right and examine the right-hand wall. A logical route should take them past all corners of the shop, passing special offers and with samples to taste as a way of keeping visitors in the shop for longer, as well as plenty of appealing products, preferably at eye level, before finally reaching the cash till. It should be located on the left of the entrance, from where the shopkeeper can greet new customers as they come in.

www.stadlandrelaties.nl/en/publications

NUTRITION SCIENTISTS 30 YEARS ON

Providing food, providing wit

While she was studying for her degree in Human Nutrition, Francesca Erdelmann had no interest in development work.

Yet she has been battling undernutrition for years now. Her fellow alumnus Rob Urgert did a PhD after graduating and then became a standup comedian. Now he makes television programmes that combine science with comedy.

TEXT ALEXANDRA BRANDERHORST PHOTOGRAPHY HARMEN DE JONG AND THOMAS CRISTOFOLETTI

All of a sudden I had to get out of my house in Yemen. I could only take one bag with me. After waiting in a hotel with other UN and NGO staff for two days, the plane could leave on 28 March 2015 between the bombardments,' says Francesca Erdelmann. She graduated in Human Nutrition in 1992 and works as a nutrition expert and these days as manager for the UN's World Food Programme (WFP). In 2012 she was posted to Yemen to help set up programmes addressing undernutrition in children and pregnant women. 'The country imports nearly all its food. It is a tribal society with a lot of poverty.' The risk of kidnapping made living and working in Yemen difficult, she recalls. 'There wasn't much freedom of movement. Transport was by armoured UN vehicle and you could only go shopping once a week with extra security.'

In 2014 the conflict between the government, local chiefs and rebel groups escalated. Now the WFP mainly provides emergency aid in Yemen.

Since June 2015 Erdelmann has been working in the Cambodian capital of Phnom Penh. 'There are people, noise and smells everywhere; it's a big contrast with the restricted life I led in Yemen. In spite of the heat I cycle to work, which I haven't done for 19 years.' She is also now living with her husband Jerrel van Beek again. During the period when she worked in Yemen, he stayed in South Africa. He graduated in Tropical Land Use in Wageningen in 1994. During their student days they lived in the same flat at the Dijkgraaf student residence and both rowed for Argo rowing club. In Cambodia Erdelmann focuses more than she used to on management. 'The nice thing

about the WFP is that you get to know different regions and you can go on developing.'

CREATIVE CHALLENGE

Rob Urgert keeps on developing too. He got his PhD in Human Nutrition in 1997 but then chose to go in a very different direction. He started out as a standup comedian, then became a television presenter, and now he makes television programmes. 'Science is an intellectual challenge. Making a television programme goes one step further – that's a creative challenge as well,' explains Urgert.

Since 2006 he and his colleague Joep van Deudekom have been making comic programmes about research, such as *Onder de tram* [Run over by a bus] and *Tussen de oren* [Between the ears]. 'My work combines comedy with science. It brings together my



‘I didn’t think
I was supposed
to be a comedian’

two passions: learning new things and making people laugh,’ says Urgert. Since 2013 he has been a guest on the satirical quiz show *De Kwis*. ‘Comedy is always a good way of raising an issue because it helps people to focus and not to lose interest,’ he says. For his latest programme, *The Institute*, which will be on television from September, 100 people will


be confined for a week and subjected to all kinds of psychological and physiological tests. Urgert: ‘For example, we are going to look at who has the most prejudices, whether women really are bitten more by mosquitoes, and how sleep deprivation affects your driving.’ His former chair group is helping with thinking up, designing and implementing the studies. ➤

ROB URGERT

Age: 47

Studied: MSc Human Nutrition, 1986-1992, PhD in Wageningen in 1997

Works: As standup comedian, television presenter and programme maker

A photograph of Francesca Erdelmann, a woman with glasses on her head, wearing a light blue cardigan over a white shirt and a pearl necklace. She is holding a blue clipboard and looking at it. Next to her, a man with glasses and a light blue shirt is also holding a blue clipboard and looking at it. They are in a warehouse filled with large white sacks of rice. The text 'Cambodian White Rice' and 'Gift of Private Donor' is visible on the sacks. In the top right corner, there is a quote in white text inside a square frame: 'I went shopping with extra security'.

‘I went shopping
with extra security’

FRANCESCA ERDELMANN

Age: 47

Studied: MSc Human Nutrition,
1986-1992

Work: as Deputy country director
of the World Food Programme in
Cambodia

Urgert grew up in Yerseke, in the Dutch coastal province of Zeeland. As a child he wanted to be a singer when he grew up, but sadly he wasn't very good at singing. He decided to go to Wageningen University because several of his secondary school friends were going there. 'I soon found out how boring Food Technology is; it's all about tinned food and the bubbles in beer.

Nutrition and Health seemed much more interesting to me. Urgert didn't go to class much but he did read the notes and attend practicals. 'At that time I drank a lot of whisky and wrote stories and light verse at night, in imitation of singer-songwriter Drs. P. I was a real loner.'

Urgert did an internship in Tanzania, where he studied the vitamin A status of under-

WHERE DO NUTRITION SCIENTISTS END UP?

Between 1975 and 2005, 1425 people graduated with an MSc in Nutrition. We know which branches 876 of them have ended up working in. About 20 percent of the alumni work at a university or research institute. Another 20 percent work in the healthcare sector. About 19 percent work in the food industry or another branch of trade and industry, and 11 percent work for government at the national or local level. A further 6 percent work for a consultancy bureau and 4 percent for an international development organization. *Source: KLV Wageningen Alumni Network*

nourished children in a remote rural area. 'That was shocking. There were chickens roaming around but if you advised a mother to give her children eggs, she said eggs were bad for unmarried girls. I weighed and measured 2500 children for the study. Ten of them enjoyed it, 100 didn't mind and the rest were totally panic-stricken.'

ASKING QUESTIONS

Just like Urgert, Erdelmann, who grew up in Roosendaal, embarked on a degree in Food Technology. Even as a child she always wanted to know what it said on the labels of food packaging. 'I was interested in food production and processing and how people went about it. In the end I combined courses about things like product knowledge and microbiology with nutrition courses about consumption, behaviour and choices.' Erdelmann was on the board and several committees at KSV student society. 'Propping up the bar was not my thing but I did like organizing events.' For her internship she went to Costa Rica together with a fellow student. Their task was to develop a formula based on factors such as soil types, weather and the market, to help farmers with making decisions. 'We conducted in-depth interviews with those farmers. That revealed emotional and socio-cultural considerations that you can't put into a formula. I still come across that in my work. Why don't some programmes catch on in the field? Because we are asking the wrong questions.' After graduating in 1992, Erdelmann got the chance to go to Somalia with a mission on undernutrition. 'I wasn't really interested in development work and health care, but I did

want to go abroad.' The mission was cancelled because of the civil war. It was difficult to find a job. Erdelmann took a course on development management and in 1994 did a work experience internship in a hospital in Lahore, Pakistan.

NERVES

Urgert did get a job straight after graduating. As a doctoral researcher his work was researching the cholesterol-raising substance cafestol in coffee, and how it can be extracted. 'I like the focus that goes with doctoral research, and I also enjoyed the writing and the project-based nature of it.' During that period Urgert got to know his wife, and mother of their three children, Caroline Spaaij. She had done the same degree programme and a PhD, and now works for the Dutch Health Council. They met one day cycling home from the Biotechnion building in Wageningen. Meanwhile Urgert was performing more and more frequently as a standup comic. 'It was very scary and if it went well I got depressed afterwards. I thought: I am a scientist; this is not what I'm supposed to be doing. But I carried on writing texts and jokes.' After his PhD graduation in 1997, Urgert wrote a standup comedy show with which he came second in the Standup festival Camaretten in November. 'I came up with a trick for hiding my nerves – starting by joking that I was in a state because I had just bumped into my ex.' Until 2000 Urgert combined his tentative standup career with a part-time job as researcher at science organization TNO. When he stopped there he created three standup comedy shows and wrote for the

satirical TV programmes *Dit Was Het Nieuws* and *Koefnoen*. He also developed a 'crash course in comedy' together with Bastiaan Geleijnse of the comic strip *Fokke & Sukke*. 'The scientist in me could approach humour in a technical, analytical way. When science began to play a bigger role in my work I thought: now I am in my element.'

KIND AND RESPECTFUL

Erdelmann's perseverance was rewarded too. In 1997 she got a job with the UN's Food and Agriculture Organization (FAO). She went to India as an assistant nutrition expert to promote good nutrition. There she developed contacts in the WFP. Between 1999 and 2012 she worked for this organization in Uganda, South Africa, Mozambique and then again in South Africa. First she worked as a nutrition expert, setting up feeding programmes in refugee camps and schools. Later she focused on AIDS and supported national HIV programmes. 'The WFP works on strategy and national solutions, but provides a lot of material assistance too,' explains Erdelmann. That thought comforts her when she is confronted by the sight of poverty and undernourished children. 'You can't burst into tears every time. You have to rationalize it.' She emphasizes that she is happy to be able to contribute to preventing undernutrition and finding solutions for people suffering the consequences of undernutrition and food insecurity. 'You can't hand out money every time you visit a poor family. But you can be kind, helpful and respectful and accept their invitation to have a cup of tea, even if you know they probably can't really afford the sugar in it.' ■

Crowdfunding for re

Wageningen researchers and students are full of creative ideas which could help make the world a better place but do not qualify for funding from regular sources. University Fund Wageningen has set up a crowdfunding platform to fill this gap.

TEXT YVONNE DE HILSTER PHOTOGRAPHY MIRJAM HOMMES

An educational video about the life that is hidden away in the soil, an app for reporting bothersome mosquitoes, and research on growing safe tomatoes on Mars: these are the first three research topics for which Wageningen scientists are launching crowdfunding appeals this spring. The minimum donation is five euros and those donating larger amounts get something nice in return.

The project leaders of the first three proposals selected by University Fund Wageningen for the new crowdfunding platform are pleased with the initiative. 'It is always a challenge to find funding when you have new ideas,' says biologist Arnold van Vliet of Wageningen University. He is seeking 25,000 euros to develop and launch an app called Muggenradar (Mosquito radar). 'We've already been making use of 'citizen science'. For the Nature radar and the Tick radar, for instance, a lot of volunteers send in data – a form of crowdsourcing. Now we hope that people will help make our research possible financially as well.'

University Fund Wageningen is experienced in fundraising for the university's good causes, including cultural heritage, student scholarships, student life and rewarding

excellence with various prizes. Most donations have come from alumni. Through the new crowdfunding platform the net will be cast wider, says coordinator Arianne van Ballegooij. 'There is enough research going on in Wageningen which will benefit people across the whole community. We'd like to keep those people in touch with our research as well.'

RELEVANCE AND URGENCY

The first project proposals for crowdfunding were discussed at the end of last year. Only students and researchers at Wageningen UR can submit a proposal, and it must be for research they want to do themselves. The Fund assesses the projects for their social relevance, their contribution to the quality of life, and their urgency.

The projects must be ones that do not qualify for funding from regular sources. One example is the project submitted by soil ecologist Gerlinde de Deyn of Wageningen University, which is at the meeting point between education and research. She would like to make a time-lapse film of soil life and its interaction with plant roots. Last year, together with internationally renowned photographer Wim van Egmond and two colleagues, she made a film of this kind

about earthworms – condensing one month into two minutes (<https://vimeo.com/110880643>). 'The new film will give a wider audience an idea of what goes on underground as well as providing material of scientific interest for research and education.'

For Wieger Wamelink, an ecologist at Alterra Wageningen UR, there is another important aspect to crowdfunding: making research visible. 'I have thought about crowdfunding for my research before, because it can enable you to involve people in your research and keep them informed about your work. That involvement and visibility are important because the support base for fundamental research seems to be dwindling. Often people don't understand that research is necessary to provide their daily bread.'

'It's a challenge to find funding for new ideas'

But the question is, the three researchers agree, how to convert interest in your research into donations. Van Vliet: 'In that sense it is an experiment for us too, and a question of learning from each other.' The first three projects have until 1 May to raise sufficient funds. Then a second round will start immediately, and there will be another chance for new projects in the autumn. ■

Info: crowdfunding.wageningenur.nl

search



TARGET SUM: €10,000

OVERVIEW OF MOSQUITO NUMBERS

How many mosquitoes constitute a nuisance, and where? And is climate change going to change this? With a mosquito radar app (see Muggenradar.nl) members of the public can easily report observations and bothersome mosquitoes, and provide photos for identification. Arnold van Vliet and his colleagues would also like to set mosquito traps at locations from which exceptionally many – or few – reports come in. This should quickly provide an overview of mosquito numbers.

SAFE TOMATOES ON MARS

TARGET SUM: €25,000

Three years ago his curiosity prompted Wieger Wamelijk to grow vegetables on sandy soils that resemble those of Mars and the moon. Last year he succeeded in growing cress, rye, peas, radishes, rocket and tomatoes. His new project is about heavy metals in the soils – lead, for instance – and whether they end up in the plant. If they do, those tomatoes could be bad for your health. The knowledge is important not just for a potential Mars expedition but also for similar problem soils on earth, and for growing crops in closed systems, in the desert for example.



TARGET SUM: €25,000

A LEADING ROLE FOR SOIL LIFE

Soil organisms work away out of sight. They release nutrients and can have a protective effect against soil diseases. Little is known, however, about the dynamics of what goes on underground. By setting up a camera installation in which plants and tree seedlings can grow for a few months in soil containing for example insect larvae and mycorrhiza fungi which co-exist with plant roots, Gerlinde de Deyn hopes to give us a glimpse of this hidden world.

EDUCATION



PHOTO SHUTTERSTOCK

Three new online courses

Wageningen University is extending its range of massive open online courses (MOOCs) in English this year to ten. The existing MOOCs, providing or basic knowledge or refreshers in nutrition and food production, have already been taken by tens of thousands of people all over the world via the online platform EdX.

Soil4Life will start on 10 May. This is a course about how soils function, the threats they face, their preservation and socio-political aspects of soil management. The MOOC on food safety will start on 1 June; it is the third course in the Nutrition & Health XSeries. Anyone completing the entire series before 1 January 2017 will be eligible for an additional certificate. A second MOOC in the Future of Food series will be available from 1 July. It will deal with environmentally friendly production and systems thinking, with a focus on the interaction between crops and livestock. The MOOCs are free of charge. Info: www.wageningenur.nl/online-education

NETWORKS

China Chapter spreads its wings

The China Alumni Chapter will be organizing more activities spread across China this year, including in the province of Hainan. That was decided after a successful first year with several meetings and excursions in and around Beijing and Shanghai. On Sunday 20 March there will be an excursion plus talk at a FrieslandCampina farm in the vicinity of Beijing. Info: alumni@wur.nl

NETWORKS

Sharing knowledge in Africa

Alumni networks are being set up in Ethiopia and Kenya. They are boosting the spread of know-how and Wageningen's visibility.

'If you bring alumni together in networks, it becomes easier for them to share know-how and skills with one another and with other Ethiopians,' says Sjors Bijen (MSc Development and Rural Innovation, 2014). He works for the BENEFIT-SBN project, which focuses on the country's sesame value chain. He is also on a small committee of alumni who are setting up a new network. It was clear that there was interest in this when the first alumni meeting was organized on 16 December by University Fund Wageningen to coincide with a working visit to Ethiopia by president of the board Louise Fresco: the Dutch embassy was able to welcome over 40 alumni. An alumni network will improve Wageningen UR's visibility in Ethiopia too, says Bijen. There are both Dutch and

Ethiopian alumni working in the country in various industries or for government authorities, universities or NGOs. 'What is more, the university will be celebrating its centenary in two years' time. Alumni networks can help make sure that alumni are properly involved in that joyful occasion.' A similar process is starting in Kenya. At the end of January, an informal meeting was organized there by alumni Sammy Letema, Christine Majale and Leah Oyake-Ombis (all three with PhDs in Environmental Sciences, 2011 and 2012) in collaboration with University Fund Wageningen. The 20 or so alumni who attended were also interested in setting up a network and the Kenyans will now try to organize such meetings more often. Info: alumni@wur.nl



Alumni attending the informal meeting at the end of January in Kenya.

ANNIVERSARY

Wageningen UR's centenary celebrations in 2018

On 9 March 2018 it will be 100 years since Wageningen University was founded. Work on drawing up a programme for the celebration of this anniversary began at the start of this year. Alumni and other Wageningen UR business relations will

also be involved in the festivities. The celebrations will probably include an alumni reunion, a major party for staff and students and a journey back in history. There will also be room for art, culture and sport. Info: wageningenur.nl/centennial

BEURS



New fund for Greek students

The University Fund Wageningen has a new named fund in its portfolio: the Pavlos Condellis Fund. Every year from September, the fund will have a grant available for a Greek student taking the Master's in Biosystems Engineering in Wageningen, preferably specializing in precision agriculture. Paul J. Condellis built up a successful farm machinery business in Greece, the oldest and largest company specializing in agricultural machinery in the country. Condellis says that he wanted his fund to be with Wageningen University because of its leading reputation in agriculture. 'In addition to new machinery, farm-



Paul J. Condellis

ing in our country needs new knowledge. I want to prepare young Greeks for the future world and the future of our country, and give them the opportunity to prove themselves.'
Info: arianne.vanballegooij@wur.nl

WAGENINGEN IN THE WORLD!

Marketing in Vietnam

Hua Kieu Phuong Mai (Management, Economics and Consumer Studies, 2012) from Vietnam has fond memories of her studies in Wageningen. It was difficult sometimes without her husband and child, but the contacts with students from all over the world and the dedicated teaching staff made life easier, she writes. 'I miss some of my teachers, especially my graduation project supervisor, and the Dutch bluntness, however difficult that could be sometimes.' She still regularly meets up with Vietnamese alumni whom she became friends with in Wageningen. Mai Hua works as a lecturer at Ho Chi Minh City University of Technology (HCMUT), School of Industrial Management (photo). She teaches Bachelor students marketing and management. 'I get satisfaction from teaching because you are sharing your knowledge. But it's not one-way traffic. I learn from the students too and they motivate me to keep up to date with my specialist area and to continue to improve.'



ALUMNIBIJEENKOMST

Conference brings alumni together

It was a lively drinks reception at the 24th Plant & Animal Genome Conference in San Diego in the United States. More than 30 alumni, most of them Dutch and including a few Wageningen UR employees, got together during the conference on 12 January. Last year was the first time that an alumni meeting was organized during the PAG; it went so well that the reception was repeated this year.



The conference itself was attended by 3700 scientists from all over the world. 'That

must have included others from Wageningen too,' thinks René Klein Lankhorst from

Wageningen UR, general director of BioSolarCells and with a WU PhD in Molecular Biology (1990). He gave a short introduction to the Wageningen of today at the gathering, which was organized by University Fund Wageningen. Another alumni gathering is scheduled during the next PAG in 2017
Info: alumni@wur.nl

PERSONALIA

Arnold Boon MSc, WU Zootechnics 1991, has been appointed university director of Aarhus University in Denmark. 1 January 2016.

Annemarie Breukers PhD, WU Biology 2002, a researcher in the sustainable development of agricultural sectors at LEI Wageningen UR, has been appointed a senior policy officer in plant health at the Dutch Federation of Agriculture and Horticulture (LTO). 1 March 2016.

Erwin Duizer PhD, WU Biology 1993 and WU PhD 1999, has been appointed head of the Global Specialized WHO Polio Laboratory at RIVM, the National Institute for Public Health and the Environment. 1 August 2015.

Prof. Louise Fresco, WU Rural Sociology of the Non-Western Regions 1976, President of the Executive Board of Wageningen UR, has been appointed the chair of the jury for the 2016 ECI Literature Prize for fiction and non-fiction. 19 January 2016.

Prof. Daan Kromhout, WU Human Nutrition 1974 and emeritus professor at the Human Nutrition department, Wageningen University, was appointed an honorary member of the Dutch Health Council upon stepping down from the council. 4 November 2015.

Marco Mensink MSc, WU Forestry 1992, has been appointed general director of Cefic, the European Chemical Industry Council in Brussels. 1 May 2016.



Marco Mensink

Michiel Uitdehaag MSc, WU Land Use Planning Sciences 2003, former alderman and deputy mayor of

Wageningen, has been appointed mayor of Texel. 21 January 2016.



Michiel Uitdehaag

Prof. Cees Veerman, WU PhD 1983, former minister of Agriculture and professor holding an endowed chair in Sustainable Rural Development at Wageningen UR, has been appointed chair of the European Commission's Agricultural Markets Task Force, which aims to improve the position of agricultural businesses in the food supply chain. 14 December 2015.



Cees Veerman

Corné Verhees PhD, WU Bioprocess Engineering 1997, has been appointed director of the Food Technology education programme at the HAS University of Applied Sciences Den Bosch. 1 February 2016.

Prof. Richard Visser, University of Groningen Biology 1984, professor of Plant Breeding and head of Wageningen UR Plant Breeding, has been appointed Dean of Research at Wageningen UR. 1 January 2016.

Albrecht Weerts PhD, WU Soil, Water and Atmosphere 1995, working for Deltares as an expert on Hydrology & Forecasting, has been appointed professor by special appointment in Hydrological Prediction in the Hydrology and Quantitative Water

Management Group at Wageningen University. 1 February 2016.

Jaap van Wenum PhD, WU Agricultural Plant Breeding 1994, has been appointed chair of the national LTO specialist group on arable farming and is consequently also a member of the LTO federation council. 3 February 2016.

HISTORY



PHOTO TAMARA REIJERS

Wageningen's barricades

Cultural historian Jobbe Wijnen, WU Biology 2003, aims to uncover the history of activism in Wageningen. He would like help from alumni.

WSO, De Uitbuyt, De Tien Zilverlingen, De Wageningse Lente, Ziedende Bintjes, Jokari and Het Imperialisme Kollektief were all familiar names once in Wageningen's left-wing activist scene in the 1970s and 1980s. But what went on exactly? Wijnen wants to produce a digital map of Wageningen showing the places where it all happened and to put articles about that activism on the WikiWageningen site. To do this, he is asking alumni for their stories and photos.

More information about the project at <https://wageningsebarricaden.wordpress.com>

GRANT



Student grant for water ambassador

Brenda Brouwer BSc, Master's student WU International Land and Water Management, has been awarded a student grant for two years by the Water Top Sector. In return, she will act as a 'water ambassador' during her degree studies. She will for example make every effort to generate enthusiasm among secondary schoolchildren for water-related degree programmes.

According to the Water Top Sector, about 40,000 professionals will be needed in the water sector from all conceivable water degree programmes in the Netherlands in the period to 2020. Grants were also awarded to 16 other students doing water-related degrees at academic and applied universities in Delft, Twente, Utrecht, The Hague, Velp, Leeuwarden and Vlissingen.

IN MEMORIAM

Alumni of Wageningen University, KLV members, staff and former employees of Wageningen UR who have recently passed away.

If you wish to inform us of the death of a fellow former student or relative, you can email alumni@wur.nl or call +31 (0)317-485191.

Mr S. Atsmon MSc, WU Agricultural Plant Breeding 1952. 16 January 2016.

Mr W.H. Barreveld MSc, WU Tropical Rural Economics 1955. 10 January 2016.

Prof. M.G. van den Berg, WU Dairy Production 1954. 9 November 2015.

Mr H. Broekhuizen MSc, WU Zootechnics 1964. 30 November 2015.

Ms D. van Burg-de Boer, honorary member of KLV. 28 January 2016.

Mr J.H.J. Ensink PhD, WU Tropical Land Use 1999. 28 December 2015.

Mr J.A. Hoenderken MSc, WU Farming Technology 1965. 30 January 2016.

Mr J.M.A. Janssen PhD, WU Water

Purification/Environmental Protection 1972. 17 November 2015.

Mr C.F.L. Kanstein MSc, WU Horticulture 1951. 29 January 2016.

Ms A. van Keulen MSc, WU Phytopathology 1992. 25 November 2015.

Mr T.R. Klootwijk MSc, WU Forestry 1974. 30 September 2015.

Mr A.F.M. Olsthoorn PhD, WU Forestry 1981. 20 January 2016.

Mr M. Suurmond MSc, WU Farming Technology 2001. 9 February 2016.

Ms M. Teekens MBA, MSc, WU PhD candidate. 11 January 2016.

Mr E. Troeleman MSc, WU Forestry 1967. 29 December 2015.

RESEARCH

Wageningen gets two European grants

The European Research Council has awarded grants to two Wageningen researchers. **Prof. Jasper van der Gucht**, WU Molecular Sciences 1999, professor of Physical Chemistry and Colloid Science at Wageningen University, was awarded a Consolidator Grant worth two million euros for fundamental research on how polymer materials break. Polymers are strongly-bonded compounds that are found both in nature (e.g. cellulose and some proteins) and in synthetic materials (e.g. plastics).

Erik Poelman PhD, WU Biology 2003, an entomologist at Wageningen University, was given a Starting Grant worth 1.5 million euros. Poelman will be studying how plants defend themselves against combinations of different enemies that eat them, such as various species of caterpillars and lice.

Info: jasper.vandergucht@wur.nl,
erik.poelman@wur.nl

COLLABORATION



Ruben Smit, WU Forestry 1996, the director of the nature film *The New Wilderness*, and cameraman **Melchert Meijer zu Schlochtern**, WU Forestry 1996, are moving to Wageningen campus with their filmmaker's collective the Netherlands Natural History Unit. They want to collaborate more with Wageningen UR.



Entering the employment market well-prepared with Young KLV

It is a recurring theme in the employment market survey of KLV: Wageningen alumni are not well prepared for all aspects of the employment market. The so-called soft skills only receive limited attention in Wageningen degree programmes. KLV aims to bridge this gap with its own Young KLV programme of workshops and training courses that prepare students and recent graduates for working life.

“Wageningen graduates have a good subject knowledge,” says Silvia Blok, employment market expert at KLV, “but when it comes to matters such as persuasiveness, decisiveness or dealing with stress and deadlines they score less well compared with what their first job demands from them. At least that is their experience according to the biannual higher education monitor.” Silvia has also just analysed the recent MSc programme evaluation. This survey with questions and propositions about the degree programme and work was sent to all recent graduates. “The respondents assessed the extent to which the MSc programme prepared them for the employment market with a fairly high score of 3.58 on a scale of 1 to 5,” says Silvia. “However one proposition really stood out: ‘Enough attention is paid to future career possibilities’. This proposition scored strikingly lower than the other ones with an average of just 2.82 on a scale of 1 to 5.”

Preparing for the employment market, having an insight into your chances on the employment market, and being able to consider your possibilities are aspects that students and young alumni have an increasing need for. Of course attention for competencies such as effective networking, presenting yourself or selling your ideas is very important in this respect. That is where KLV has a clear added value. Young KLV, the ‘young branch’ of KLV that focuses on students and recent graduates is therefore making clear inroads with a programme of workshops and activities that can bridge this gap. Several components are fixed items: the CV check, the course LinkedIn, and the work search cafe, for example. “There is a real need for these,” says Young KLV Ambassador Pleun Bonekamp, who also represents the Young KLV Ambassadors in the KLV board. “I have noticed that myself and I hear it from others as well. As you approach your gradu-

ation you are suddenly expected to know how you should apply for jobs and how to network effectively, even though nobody has told you how to write a good letter of motivation, how to put together your CV and what you should or should not place on LinkedIn.”

Continuous development

“A really positive aspect is that the workshops are accessible for everybody and you can follow these when you need them,” adds Jasper van der Woude. He graduated in 2014 and he is also one of the board members of KLV. “In the degree programmes several modules focus on skills, such as writing your dissertation or negotiation skills. However these are given fairly late in the degree programme. Furthermore, as a student you have a limited number of options and so you cannot do all of these modules. The KLV workshops are smaller and easier to digest. You can



start with these far earlier in your degree programme and take a workshop when you want to. This allows you to work on your personal development step by step.” Understanding future career options also means understanding your personal strengths. For example, Young KLV has organised the course ‘Being the best you can be’, in other words: how to get the best out of yourself? Jasper: “For me that workshop had a real added value because it forced me to think about what I am good at and what I really want to do. And in my view you cannot start working on that early enough. Because if you have a clear idea of that for yourself, it is easier to convince a potential employer about this.”

Young KLV operates very independently with its own budget and ‘ambassadors’ who come up with the activities they want to organise. “Besides the recurring elements there are also several new activities each year,” says Jasper, “in order to meet needs but also to test if an activity is successful.” Pleun adds: “As an ambassador I am at the heart of the target group and so I hear from people around me what students miss and what the needs are. We recently held a poll for the Wageningen Career Day on 2 February 2016: Which

workshop should we organise? The winner was ‘How to dress for success’. Are you overdressed as a man if you wear a suit to an interview? As a woman do you always have to wear a skirt? These are very practical questions that people want an answer to!”

Wider deployment

“Young KLV is taken seriously by KLV,” concludes Jasper. “If you want to secure your future as an alumni association then you need to appeal to different generations. Of course you must also be attractive to and connect with the young generation; Young KLV is the answer to this. I think that we can deploy our training courses and workshops more widely. An example is alumni between 30 and 45 years old who no longer live in Wageningen and who are quite a difficult target group to reach. This year we want to carry out a sort of pilot in which we organise several activities for them outside Wageningen that are focused on personal development, for example ‘Being the best you can be’ or a work search cafe for alumni aged 40 and over. Then we can put Young KLV’s success to good use in the region! We will organise these activities together with our partner KLV Professional Match.”

About the Young KLV Programme

The Young KLV programme focuses on the members within KLV who are a student or who have recently graduated (in the past five years). Five active young members, the Young KLV Ambassadors, organise activities in collaboration with KLV that are specifically focused on a good preparation for the employment market, gaining experience with networking or setting up a company. More info: klv.nl/youngklv

Young KLV activities in 2015, per category:



Preparation for the employment market (incl. opportunities on the employment market, possibilities, motives and talents): **13**



Informative (e.g. borrowing for your study in collaboration with DUO): **2**



Soft skills (incl. time management and stress management): **7**

NB: It is difficult to say something meaningful about the average number of participants per session. The number of participants strongly depends on the type of activity. It varies from 7 for quite an intensive training course such as CV writing to 90 for a lecture. ‘A total of 51% of KLV members belong to the target group of the Young KLV programme.’

INVITATION

If you check our KLV Facebook page on a regularly base, you will be informed what KLV has been up to and what we are working on. This way you will keep in touch with the alumni association of your Wageningen University. Of course you are welcome to post your own interesting status updates too.

Join KLVNetwork!



www.facebook.com/klvnetwork

ACTIVITIES

Info: klv.nl/en (unless indicated otherwise)

20 June

General Assembly of KLV

YOUNG KLV PROGRAMME

22 March

Course CV writing

10 May

BCF Career event 2016
(free for KLV-members)

7 June

Course CV writing

WANT TO BECOME A MEMBER?
Go to klv.nl/membership



PHOTO JOUKE CAMPEN

Water-saving greenhouses in Abu Dhabi

In Abu Dhabi vegetables are grown in plastic-covered tunnels with air humidifiers. The tunnels are for keeping out not the cold, but the scorching heat and the bone-dry air. The emirate called on Wageningen UR Greenhouse Horticulture for help with becoming more self-sufficient and saving water. 'When it comes to greenhouse design and technology, the Netherlands is the global

leader, which is why they came to us for a research greenhouse for improved horticulture,' says project leader Jouke Campen. Together with Sjaak Bakker (in the photo), he advised on the design of the 3000-metre complex. To save water they opted for a form of air conditioning. 'We also assisted in finding and vetting a Dutch greenhouse construction company, and with the research design,

choice of seed – mainly tomato, cucumber and bell pepper – and biological pest control,' says Campen. Wageningen UR will continue to help analyse data and provide training for some time. In Riyadh, the capital of Saudi Arabia, food will be grown from this March in a greenhouse three times the size of this one, also designed in Wageningen. *Info: jouke.campen@wur.nl* ■