WUR from within: straight, sharp, transparent

No 01

Resource

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The journalism platform for all at Wageningen University & Research

Fewer resits
More resit periods

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about nitrogen'

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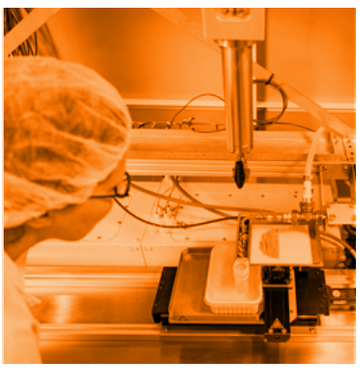

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FOREWORD

Tipping point

Scientists do not study negative climate scenarios enough because they are afraid of being called prophets of doom. And we do research that we should really no longer be doing. I am paraphrasing two sentences from articles in this first *Resource* issue of the academic year. There is a lot going on in the domain in which WUR researchers and students operate. And it seems as if showing 'what is wrong' is no longer enough to get society to change; science also needs to show 'what is possible'. Is that the new stance that WUR will be adopting from now on as a scientific institution? Is this a tipping point?

This year once again, we aim to track developments such as this and present you with daily news and stories about WUR and its people, with the journalistic dedication and independence that are our trademarks. WUR people play an essential role in times like this when — and I quote now from this issue — 'it could turn out well or it could go wrong'.

Finally, we have revamped the magazine somewhat with new sections and a touch of humour. That makes it all more bearable...

Willem Andrée
Editor-in-chief

ONE AID, SIX FUN DAYS

After two years in a row in which AID was divided into two because of the coronavirus, it was back to one big AID this year. About 2250 new students came to Wageningen to get to know the town, university, sports clubs, study associations, student societies and of course their fellow students. Three highlights: an assault course on Generaal Foulkesweg with input from the Ministry of Defence; the largest AID Sing Along ever; and the closing festival on campus (see photo). LZ

For more AID photos, see resource-online.nl

Photo Marieke Enter

‘Fewer resits, more resit periods’

The Executive Board wants to reduce the number of resits students are allowed per course from two to one per year. This is evident from a new proposed decision. The Student Staff Council still needs to give its consent.

In the proposal, the number of resit periods will increase from two to three per academic year: one in January for the resits of period 1; one in May for periods 2, 3 and 4; and one in July for periods 5 and 6. The idea is that this will spread the resits across the year and avoid a peak at the end of the year with a high study load and lot of work pressure. If the Council agrees to this, the academic calendar will be adjusted accordingly.

Spreading out the resits means less work and study pressure at the end of the year

WUR has the most flexible resit policy in the Netherlands: students are allowed to resit an exam an unlimited number of times; they can often start on follow-up courses before passing the foundation course; and they can take a resit no matter what grade they got (whereas at Utrecht University, for example, you have to get at least a 4 to resit the exam – if you get a lower grade than that, you have to retake the whole course). Students see this as positive, lecturers as negative: making new exams and marking them adds to teachers’ already heavy workload.
The Student Staff Council (a consultative body with representatives of both the students and staff) will consider the new proposal in October. LZ

Read more about this topic on resource-online.nl

Wanted urgently: rooms for 70 exchange students

Two weeks before the start of the academic year and 100 of the 270 exchange students due to begin at Wageningen in September still had no room. Now 30 can share a room in Dijkgraaf.

Each year, WUR reserves hundreds of rooms with Idealis for the regular international students, who get priority in room allocations. Exchange students don’t qualify for the priority allocation but that is not usually a problem as there are generally enough rooms on offer through sublets by WUR students going abroad. But this year that system does not seem to be working, and about 100 exchange students still had no room just two weeks before the start of the academic year.

Subletting market

A solution has now been found for 30 of the 100 exchange students, says Ingrid Hijman, head of the Student Service Centre. ‘Idealis had 15 rooms left in Dijkgraaf. The fire brigade has given Idealis permission to temporarily have two students sharing a room.’
A call has also been placed on the intranet asking whether WUR staff could temporarily offer a room to an exchange student. ‘Even if only one person is able to house one student for a while, that would be great,’ says Hijman.
Hijman says the subletting market is clogging up but it is not clear what is causing the problem. ‘Whatever is up, it is shocking that 100 exchange students can’t find a room. That probably means many of them won’t come to study here after all. That is particularly annoying for the individual students, who will have to completely rethink their study plans. Some of them have already sublet their own room in their home country. It is also bad for our relations with our partner universities. We hope this is a temporary problem but that is difficult to predict because we don’t have any influence over the subletting market.’ LZ

See also ‘The student housing market is tight’ on page 18.

300

The start of the academic year will partly be celebrated in the town centre this year. The university has invited Wageningen residents to the Grote Kerk, the church in the market, on 5 September for the opening ceremony. It will be packed: 300 people have already registered and that is the maximum capacity. 960 people will attend the campus part of the ceremony, either in person in Omnia or online. WA

‘Good conversation’ about nitrogen

Around 100 people involved in the food system – farmers, nature workers, scientists, the media and others – got together in Impulse last week for what was intended to be ‘just a good conversation’ about agriculture, nature and nitrogen – without any rows or recriminations. The initiative came from the FoodHub founder Joris Lohman and dairy farmer Geertjan Kloosterboer, after this thorny issue threatened to drive a wedge between these two friends who had known one another for years.

And it *was* a good conversation: everyone listened to one another, there were no ‘yes buts’ and no one left the building with a face like thunder. But anyone secretly hoping for a way out of the nitrogen impasse had to acknowledge there was no sign of that either. ‘Even the pioneers here ended up discussing the same old issues,’ concluded the FoodHub director. ‘I think we need to look harder at what we want to achieve – as a society. Because this is not just a farming issue; the discontent is everywhere in the Netherlands.’

The evening was not in vain. ‘If we keep talking to one another like this, we will still get somewhere,’ said Kloosterboer. ME

Don’t apply for energy allowance yet

Wageningen municipality agrees students should also get an energy allowance but it doesn’t have the staff and funds to implement this yet.

This message comes from the municipal executive. The municipality is responding to student union LSVb’s call to students to apply for the energy allowance.

The energy allowance of 800 euros (initially) is aimed at helping people on low incomes pay their rising energy bills. Students are currently excluded from the scheme, but LSVb says a ruling by the law court in Arnhem changes things. The court ruled that it was wrong to deny students the energy allowance.

The students have the support of Wageningen municipality in principle. ‘We also believe that students on low incomes with high energy bills should get an energy allowance,’ says the municipal executive. ‘But we have not been given the money for this by the national government. We also do not have enough staff to handle the applications from students.’

‘We don’t have enough staff to handle students’ applications’

Rejected

To date, the municipality has received 450 applications for an energy allowance. They include several dozen from students. But many applications still have to be processed. At present, applications by students are being rejected. The LSVb and FNV Young & United unions advise students to submit a formal objection.

The municipality asks students to wait until more is known about a nationwide scheme for students. That will also allow the municipality to finish dealing with the applications from non-students. Students in distress can contact Startpunt (0317-410160). The special assistance scheme is also an option for individual compensation to help with rising energy bills.

Wageningen and other municipalities have now called on the government to come up with an ‘appropriate and feasible’ scheme for students. RK

Vegetarian AID sparks protest and commotion

The weather was sunny and the mood relaxed. Finally an AID without Covid restrictions, and one that was fully vegetarian. But there was also a minor commotion in the form of a small-scale protest against the vegetarian AID menus.

The instigator was Animal Sciences alumnus Fleur Bartels, who works for the pig farmers' association POV. She and two co-protesters made their objections to the vegetarian AID clear at the barbecue on the Monday. 'I can understand how WUR people in particular feel a responsibility to think about what ends up on the menu, but it hurts to see meat banned entirely from AID,' she said. 'There are so many WUR alumni who work hard with farmers every day to make livestock farming more sustainable and animal friendly.'

'It hurts to see meat banned entirely from AID'

Wrong impression

Animal Sciences programme coordinator René Kwakkel says other alumni and business contacts were also not too pleased to hear about the vegetarian AID. 'It gives the impression that Wageningen sees a completely vegetarian diet as the only sustainable option and is gradually turning away from livestock farming,' he says. 'But that is absolutely not the case.'. Kwakkel would have preferred to see some sustainable meat products served at the AID, like the Animal Sciences group did at its barbecue for its own students. 'Which the AID committee had been informed about, and which was planned before this commotion started,' emphasizes Kwakkel.

The 'meat protest' did not cause much of a stir among the AID participants themselves, but there was more of a discussion online. 'Protest? OMG, how sad!' and 'Fortunately, more and more animal scientists realize things need to change and completely support the transition to vegetarian food' were two of the comments on Twitter. Along with: 'New students have no problem with vegetarian food but alumni in the meat industry do – it makes you think.' The whole debate provides food for thought for next year's AID committee. *Resource* will keep you up to date on what they decide. ME

Quarter of first-years without room

University classes are due to start next week but lots of students still do not have a room, shows a poll by *Resource* among 114 first-years at AID. One in three first-years does not yet have a room. Some of them are not looking either as they prefer to live with their parents. A quarter of first-year students would like a room but have not found one.

That means the room shortage is not as bad as a year ago, when the impact of the coronavirus was a distorting factor in the market. In 2020, many first-years stayed at home because all teaching was online, which led to a peak in demand the following year. The current figures are comparable with the situation in 2019 before the pandemic.

The *Resource* survey also shows that WUR still enjoys a high reputation as a place to study. Most first-years by far chose Wageningen because of its good name and/or because it was the only university offering that degree subject. Reasons for the choice of degree are as idealistic as ever. Over half the students want to make the world a better place. A good job and big salary barely play any role at all. RK

Less resistance to antibiotics among farm animals

Gut bacteria in farm animals have become less resistant to antibiotics over the past 10 years.

This finding comes from the 'NethMap/MARAN' report produced by the National Institute for Public Health & the Environment, Wageningen Bioveterinary Research and Utrecht University. The government has tasked these institutes with monitoring antibiotic resistance in humans and animals and in food products.
In broiler chickens, antibiotic resistance has fallen to its lowest level since 1998. That reflects the big drop in the use of antibiotics for these birds: down 30 per cent in 2021 compared with the previous year, according to data from the Netherlands Veterinary Medicines Institute.

Decrease reflects big drop in the use of antibiotics for these birds

This institute also reported a fall in the sale and use of antibiotics for farm animals across the board. There has been a decrease of 70.8 per cent compared with the reference year 2009. This decline can be explained partly by the introduction in 2015 of stricter rules for antibiotics that are crucial in treating infections in humans. Such antibiotics can now only be used for animals in exceptional circumstances.

Public health

Antibiotic resistance in farm animals is monitored annually. The Netherlands Food and Consumer Product Safety Authority takes random samples from broiler chickens, pigs and veal calves, which Wageningen Bioveterinary Research then tests for antibiotic resistance. 'In that monitoring programme, we examine *E. coli*, *Salmonella* and *Campylobacter* bacteria. They cause food infections and therefore need to be monitored carefully for public health reasons,' explains Kees Veldman, who works at Wageningen Bioveterinary Research as the head of the National Reference Laboratory for antibiotic resistance in animals. ME

Photo: Pixabay

The more conspicuous, the bigger the brain

Why is one frog conspicuously colourful while another blends into the background? Biologist Alexander Kotrschal (Behavioural Ecology) and a group of Chinese researchers have found an explanation: it has to do with camouflage and predation.

The idea arose during a visit to his Chinese colleagues when he heard that some frogs are easier to catch than others. 'Once you spot them, well-camouflaged frogs are easier to catch than conspicuous, colourful frogs. Why is that? Could the well-camouflaged frogs be less clever?' A quick initial test did indeed point in that direction.
'We took lots of photos of frogs in their natural environment and showed them to 10 Chinese students,' says Kotrschal. 'They were asked to rank the frogs according to how well they were camouflaged. That rating had an association with the size of the frogs' brains.' This was the prelude to a much larger study involving more than 100 species of frogs.

Energy guzzler

'In the natural world in general, the larger the brain, the greater the chances of survival,' Kotrschal explains. 'After all, you are smarter and better able to escape your attackers. But brains use a lot of energy. In an environment with high predation pressure where energy (food) is scarce, having a large brain is a disadvantage.'

'In an environment where food is scarce, a large brain is a disadvantage'

Under high predation pressure, animals with smaller brains are at an advantage because they need less energy. Camouflage helps prevent the animal from being eaten. Incidentally, brain size is only a rough indicator of mental capacity and the link with camouflage. 'I would really like to know which aspects of cognition are related to which properties. I am studying this with guppies in my lab in Wageningen.' RK

[You win some , you lose some]

NEW

An experiment that goes wrong, an error in your model, a rejected article: in academia such things tend to be labelled failures. As for talking about failure? Not done! But that's just what WUR co-workers do in this regular feature 'You win some, you lose some'. Because failure can be useful. In this instalment, we hear from Erik Poelman, association professor of Entomology. Illustration Stijn Schreven

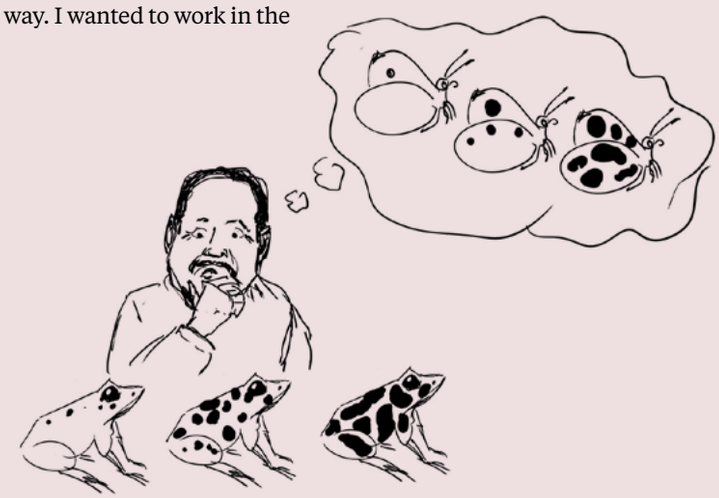
'When I was nearing graduation, I applied for a grant to do research on poison dart frogs. I wanted to do the research in the Entomology department. I was convinced that that could work, but the review committee questioned whether the proposed study belonged in that department. The reviewers praised the proposal but I didn't get the Dutch Research Council grant. As a young researcher, I didn't realize how competitive these applications were and what the jury looks for.

'I was terribly disappointed, but it didn't feel like failure to me. In science, more things don't work out than do; that's all part of the game. Failure is too strong a word for it. My dream was to work on frogs, but I had defined the context within which I wanted to do so and that didn't go my way. I wanted to work in the Netherlands, because I feel at home here and I am close to my family. That limited my options, but those core values were more important to me than any scientific career. And they still are.

'In science, more things don't work out than do'

'After that rejection, I realized that it was primarily the questions about evolution that fascinated me, and which organism I studied didn't really matter. So I started to focus on insects and plants and then Entomology was the right place for me and I did get a grant. It might not be what I had envisaged, but I am just as able to use my creativity and enjoy myself here.

'In addition to the plant and insect work during my PhD research, I did two lots of fieldwork in Ecuador working on poison dart frogs. I couldn't let go of the frogs completely and I still keep some at home in terraria, as a hobby. So they have become part of who I am in a different way.' ss



Picking fruit with cuttlefish arms

Experimental Zoology researcher Guillermo Amador got a Vidi grant from the Dutch Research Council to apply knowledge of the suction cups of cuttlefish, a relative of the squid, in soft robotics. At present, robots' grippers are often too hard and sharp. In medical operations, metal grippers can damage the skin or organs, while robots that pick fruit damage strawberries and apples.

Amador first wants to find out how exactly the cuttlefish uses its tentacles and suction cups.

At present, robots' grippers are often too hard and sharp

A PhD student will use images from a high-speed camera to calculate the forces on the suction cup. A second PhD candidate will map the tissues in the tentacles and suction cups. A tentacle is like a hand with 100 fingers. Amador wants to find out more about the connective tissue, cartilage and muscles around the suction cups.

He then plans to replicate the suction cups on a physical robot arm, using a 3D printer or soft plastic moulds. Amador is collaborating with Delft University of Technology for the medical applications, and with the Biosystems Engineering and Physical Chemistry & Soft Matter groups for the fruit-picking robots. ss

Computer counts birds

Wind turbines affect the behaviour of birds such as guillemots and razorbills, but it is not clear how exactly. Counts of birds from the sky can help answer this question. WUR is now teaching computers to count birds using aerial photos. At present, birds are counted manually: observers in planes count the birds they see. That is not only time-consuming but also increasingly becoming impossible. Wind turbines are getting taller, so the planes have to fly higher, and at such heights the human eye no longer spots much. Aerial photos from a greater height (500 metres) are the solution. Researchers at Agro Food Robotics are now teaching computers to count the birds in these photos. The differences between the pictures in and around the wind farms show the distribution of the birds and give information about the loss of habitat due to the wind turbines. RK

WUR is teaching computers to count birds using aerial photos

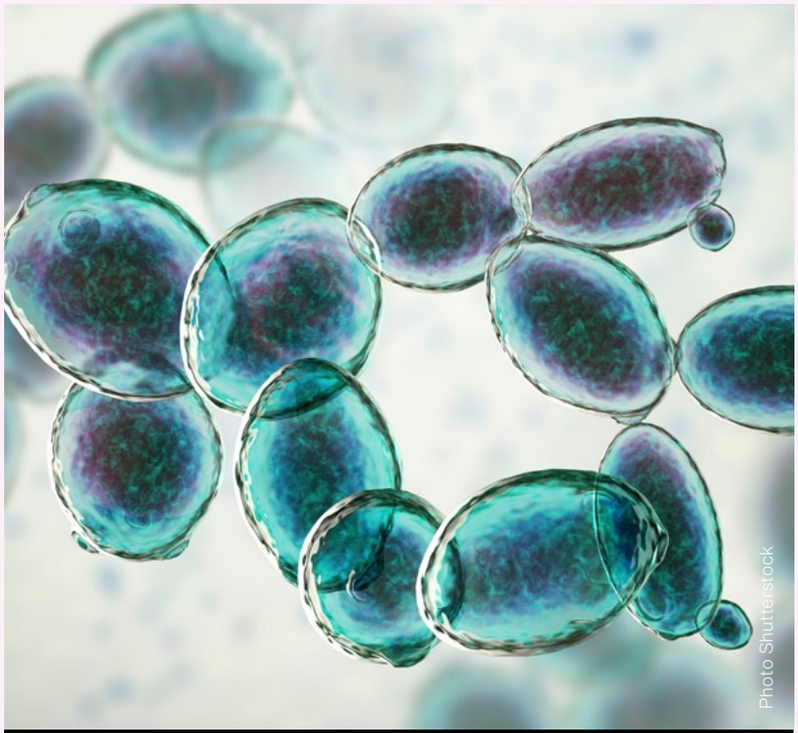


Photo Shutterstock

Baker's yeast beats petroleum

Bacteria and yeasts (such as baker's yeast, see photo) can produce chemicals sustainably that we currently get from fossil fuels. But they are not yet that efficient. Ruud Weusthuis (Bioprocess Technology) got a grant from the Dutch Research Council to tweak microbes to make them produce substances like acetone more efficiently. For the maximum yield, you need to be able to control the route taken by electrons in a living cell. Weusthuis wants to insert a new electron carrier in the cell so only enzymes in the desired route can use the electrons. SS

In brief

Gut microbes eliminate hydrogen

An excess of hydrogen gas can slow down fermentation in our intestines. That is bad news because fermentation extracts nutrients from dietary fibre and helps keep us healthy. The stomach pains experienced by patients with irritable bowel syndrome (IBS) are associated with high concentrations of hydrogen. Taojun Wang (Microbiology) studied gut microbes that use hydrogen as a source of energy and could therefore be used to resolve the problem. Wang suspects the hydrogenotrophic microbes could be an interesting option for the treatment of IBS. SS

Is it affordable?

The healthcare exercise programme X-Fittt 2.0 was started in Arnhem in 2016 for people with low incomes. Lisanne Mulderij obtained her PhD for her study of the effectiveness of this two-year programme. An important reason why people did not keep up the exercise after the programme ended was lack of money. The basic health insurance covers the care side of lifestyle interventions, such as the dietician, but not the sports and exercise side. Mulderij thinks it would be better if health insurers did cover this, for example by providing a free sports pass. SS

Social stress reinforces harmful beliefs

Stress increases the rigidity of the beliefs underlying psychiatric disorders, prejudices and conspiracy theories, according to a recent publication in *PNAS*, with Wageningen 'tipping-point professor' Marten Scheffer as lead author. The findings of Scheffer and his co-authors explain why conspiracy theories and psychiatric disorders tend historically to peak during periods of crisis, in other words during great social stress. According to the authors, measures aimed at reducing social stress such as a basic income or better job protection could be effective in tackling these problems. ME

Read the full report on Resource-online.nl

Beets dislike quinoa

WUR researchers are using age-old methods and adding new knowledge by testing which combinations of varieties and crops work well.

In the Droevendaal field, researcher Peter Bourke is working with Unifarm employees, students and other researchers on an experiment with strip cropping and 'pixel farming'. The hectare of organic farmland is divided into 800 plots for growing nine crops, ranging from oats to buckwheat and from beetroot to quinoa. There are three varieties of each crop. 'We want to see how we can test as many combinations as possible without using too much land,' explains Bourke. Bourke and his colleagues — from Soil Biology, Crop Systems Analysis, Farming Systems Ecology and other groups — have divided the field into strips and the strips into plots. 'We don't just want to investigate which combinations work well, but also develop methods for breeding crops that are better suited for cultivation in combination with another crop.'

Of course there is nothing new about this approach for crop trials and cultivation, says Bourke. It is essentially the rediscovery of age-old expertise. 'We have long known that some crop combinations work well. Take broad beans. The beans don't need much nitrogen as they can fix nitrogen themselves, so you can grow them in combination with a crop with a greater nitrogen requirement. That is ecological knowledge that we can apply in agriculture. If we want to cut the use of pesticides, we will need different systems, like the ones used in the past.'

The 800 plots are being harvested in stages: first the endives, then the buckwheat. Bourke: 'We are already seeing some interesting things. For example, beetroots do poorly in combination with quinoa. That could be due to the drought. But farmers should steer clear of that combination.' The project will continue until the end of 2024. WA

NEW

THE PROPOSITION

For PhD candidates, the thesis propositions are an opportunity to highlight their professional and personal convictions about science and society. In this feature they explain their most thought-provoking proposition. This time it is Lena Hommes (Water Resources Management), who defended her thesis on 6 July 2022.

'Synchronizing PhD activities with the menstrual cycle is key for female PhDs' wellbeing and productivity.'

'During the last stage of my PhD, I noticed that I was super productive on some days and frustrated on others. I was already monitoring my menstrual cycle and I started talking to other people about it. They forwarded me podcasts and papers. That's how I became aware that some of the highs and lows in my work were related to my cycle.

This awareness helped me accept the fact that there were days when I was less productive, and to make better use of the creative days. I am at my most energetic and creative near my ovulation. These were the days when I wrote my thesis propositions and the general discussion. I have less energy in the days leading up to my menstruation, so I would work shorter days then and focus on simpler tasks such as the references. It helped me accept myself and my feelings, my needs and my capacities. I felt more balanced and happier.

There is a trend of being more open about menstruation, but the focus is often still on the negative aspects like period pains. This openness is a good thing, but the menstrual cycle is also beautiful and powerful. You can use it to your advantage. A recent development in society is cycle syncing: aligning your work with the stages of your menstrual cycle. Accepting that you have good days and not so good days can help you be more flexible in planning your work, reduce stress levels and increase productivity.' SS

'There is more openness about menstruation'

Scabies

Sjoukje Osinga

‘I’ve got scabies,’ my son announced on the family WhatsApp group at the beginning of April. Scabies? Yup. His whole house was affected and now he had it too. ‘What a coincidence, someone in my house has scabies too,’ responded my other son. ‘Mine too,’ piped up the third. All three of them are at university in Utrecht and living in student houses.

It took me a while to get over this news. I had read in the newspaper that scabies is a growing problem in university cities: Utrecht, Nijmegen, Groningen, Leiden. It will be no different in Wageningen.

‘A scabies-creaming party? Ah yes, might as well make a party of it ’

My sons were not too bothered about it, though. You just draw up a plan of action, and you get rid of it. Everyone in the house has to rub cream into their skin from head to toe, put all their bedding and clothes in a hot wash, and bag up anything that can’t be washed in closed bin bags and leave it for several days. ‘I’m having a scabies-creaming party with my housemates tonight,’ texted the youngest. Ah yes, of course! Rubbing cream into each other’s backs over a drink or two, might as well make a party of it.

My husband and I were not too scared we’d catch it. You get it from at least 15 minutes of skin-to-skin contact and we are not that touchy-feely in our family.

But six weeks later, we had it too. The infection had happened earlier, apparently – via the sofa maybe? The incubation period is about six weeks and it also takes a while before you realize that you are itching like mad. But hey, we would tackle this problem. We applied cream and followed all the hygiene instructions to the letter: we did all the right things. But there was no improvement. The itching was maddening, especially at night – and it actually got worse after treatment. We gradually developed a great admiration for students. It took three courses of cream treatment, two courses of pills, five rounds of disinfecting the house and another two months of itching before we dared to believe it was all over.

Scabies is a nasty and an urgent problem and is not just ‘prevalent among students’. It’s strange that I don’t know any other non-students who have scabies, although there probably are more people like us. Shame is not going to help us, and that is why I am ‘coming out’. Listen up and spread the news! Scabies itches!

Sjoukje Osinga (54) is a university lecturer in Information Technology. She sings alto in the Wageningen chamber choir Musica Vocale, has three sons at university and enjoys bird-watching in the Binnenveldse Hooilanden with her husband.

Scientists systematically underplay negative scenarios

Crossing the boundary

The theme of the upcoming opening of the academic year is Planetary Boundaries. We are crossing more and more of our planet's boundaries. And yet all hope is not lost, says Professor Marten Scheffer, one of the speakers at the opening.

Text Roelof Kleis

Heat, drought and floods are turning into almost everyday phenomena. This year's hot summer might prove the coolest of the coming decades. So it's no wonder that the opening of this academic year will focus on the boundaries of planet Earth. These boundaries guarantee stable living conditions, provided they are maintained. The term 'planetary boundaries' has Wageningen roots, actually. Marten Scheffer, Professor of Aquatic Ecology, was co-author of the 2009 article in *Nature* that coined the term. In the paper, 'A safe operating space for humanity', a group of international scientists led by the Swede Johan Rockström set out the boundaries we must not exceed in nine essential subsystems of the Earth's system. These include the amount of CO2 in the air, the rate of decline of biodiversity and the acidity of the oceans. Within these nine boundaries, it is safe to live on earth. Beyond them, we enter an unsafe, uncertain and possibly catastrophic future. The message was condensed into a crystal-clear graphic depicting the boundaries for all to see (see illustration). At the time, the boundaries were already being crossed in three areas: the loss of biodiversity, CO_2 levels in the air and the disruption of the nitrogen cycle.

6244 citations

The paper hit home. 'This one had and is still having a huge impact,' says Scheffer. The count on Scopus, the search engine for scientific articles, is currently at 6244 citations. In Scheffer's own extensive oeuvre, it is the most cited work by far. 'Why has it been such a success? I think because it is written from a positive perspective,' says Scheffer. 'A safe space for humanity is a very appealing prospect. With that starting point, you don't frame it in terms of dangerous boundaries that you mustn't cross. Instead, it works the other way round: so far, so safe.'

It was Rockstrom who took the initiative for the article. 'He wanted a clear image, a visual aid for a clear story, which would be inspiring and supportive for the pursuit of sustainability in politics. To this end, he invited a number of people to contribute. My British colleague Tim Lenton and I came onboard as representatives of the idea of tipping points, the critical boundaries of the climate. But you can't pinpoint such global tipping points precisely. You don't know for sure if there is one, and if there is one, where exactly it is. There is uncertainty. The safe operating space referred to in the article demarcates this uncertainty. It is the space you have to stay in. Beyond it there is uncertainty and dangerous things can happen'.

The 2009 success story did not end there. The Stockholm Resilience Centre updates the data annually and, with

'We will have to prepare for a darker scenario'

Marten Scheffer: 'The more we know, the more we see that the planet is in worse shape than we thought.' ◆ Photo Shutterstock

minor adjustments, the concept still holds true. But more than a decade down the line, the picture is no rosier. The latest graphic shows that we have now crossed five of the nine safe boundaries. In terms of pollution and land use, too, we have arrived in terra incognita, according to the researchers. Only the use of fresh water, the acidity of the oceans, the ozone layer and the level of aerosols in the air remain within the safe limit.

Decline

'The more we know, the more we see that the subsystems of the planet we depend on are in worse shape than we thought,' Scheffer responds. 'That they are more fragile than we realized. On the whole, sadly, things are not going in the right direction. There are occasional small improvements, such as when a species adapts better than we expected. But the overall picture we get is that the climate and biodiversity are deteriorating. The more we understand the system, the more we see that it is more precarious than we realized.'

'It could turn out well or it could go wrong. It's up to us'

The decline seems unstoppable. And that is not because we do not understand the climate system or nature. Scheffer: 'In general, we know perfectly well what we need to do. What should be done about climate change? Leave the fossil fuels in the ground. How do you reduce the loss of biodiversity? Keep your hands off nature. Or, in practical terms: eat less meat. We know it, but we don't do it. I am a biologist, but recently I have noticed that I am studying humans more and more. Not just because people are interesting, but also to understand where the problem lies. Why we can't manage to do the right thing.'

Darker scenarios

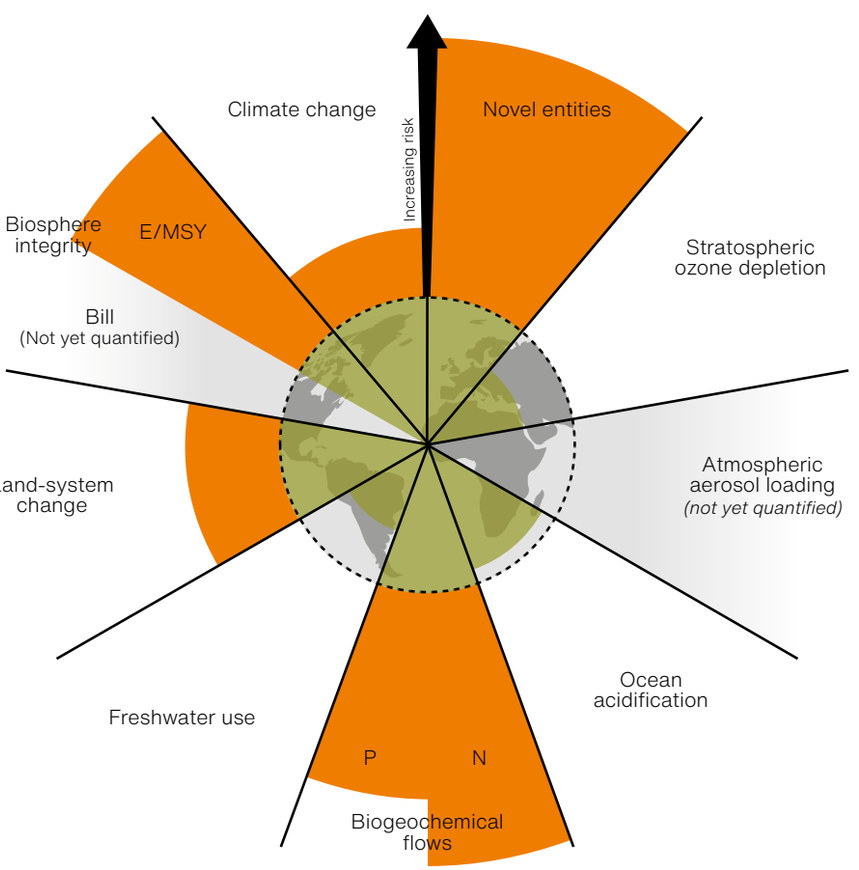
That we and the planet are entering uncharted territory is now certain. The comforting prospect of a safe space is increasingly out of reach. It is therefore high time we explored the perilous world on the other side of the boundary. This is the appeal made by Scheffer and an international group of colleagues (including five co-authors of the 2009 paper) in an article published in *PNAS* this summer. The piece has the ominous title 'Climate Endgame: Exploring catastrophic climate

change scenarios'.
So has defeatism set in, now that the safe space is fast disappearing from view?
'No,' says Scheffer, 'I don't think so. Our main message is to point out that scientists systematically underplay negative scenarios for fear of being called prophets of doom. We can still limit the damage by reducing greenhouse gas emissions. But we must also prepare for darker scenarios. Even if we succeed in keeping global warming below two degrees, which is unlikely by the way, there will still be a lot of consequences we shall have to address. Our plea is to study these consequences as a whole. Not just to look at the direct effects of climate change on crops or people, but also to look at indirect effects, such as the emergence of uncontrolled migration or armed conflicts. And take a look at the way things can all happen at once: droughts that occur in different places at the same time, a hurricane that knocks out the electricity so that the air conditioning no longer works, just when there is a heat wave that pushes urban temperatures up to 50 degrees. All sorts of things can happen and they don't come entirely out of the blue. At present that is still the stuff of popular science writing. Our plea is that we scientists must provide the most reliable possible information on these things and stop evading the issue'.

Hope

Facing up to a 'climate endgame' or 'worst-case warming' doesn't sound a very hopeful prospect. 'And yet there is reason for hope,' says Scheffer. 'Something is brewing. It may seem as if nothing is changing, but that is what you see when you are approaching a tipping point too. I think that in various ways there is something brewing in society. There is a growing awareness that things are heading in the wrong direction. And people are fervently looking for ways to do something about it.'
According to Scheffer, WUR plays an important role as a guide in this process. 'If you want to change society for the better, if you want to get humanity to change direction, you not only have to know what is wrong, but also to show what is possible, where we could be heading. WUR must develop that narrative. Technological solutions alone are no longer enough. It is also a question of things like building with nature, systemic change in our food production, identifying barriers in the way society thinks.'
According to Scheffer, Wageningen is clearly shifting in that direction. 'And we are an incredible powerhouse. Including our students, for sure. I am often so impressed by how well students think about and work on these things. This is an important moment in human history and we can play an important role in it. It could turn out well or it could go wrong. It's up to us. It's our call.' ■

'We know perfectly well what we need to do, but we don't do it'



The boundaries for maintaining a habitable planet (in the middle) have been established for nine issues. Five of these boundaries have already been exceeded (by far). ◆ Illustration Stockholm Resilience Centre

Drought

The Netherlands is ripe for ‘land consolidation 2.0’

The current drought is alarming. But at other times, heavy rainfall causes major problems. The solution to the two problems is the same, says aquatic ecologist Piet Verdonschot. ‘Flooding and drought are two sides of the same coin: it’s all about retaining the water longer in all the watercourses of the system’.

Traditionally, the Netherlands has mainly battled with a surplus of water. Water always had to be drained as quickly as possible - to keep our feet dry, but more particularly for agriculture. Verdonschot: ‘We have built an entire system. We started with canalization to drain off water quickly. When that went too fast, we built weirs to regulate the discharge’.
‘Because agriculture began to use heavier and heavier machinery,’ Verdonschot continues, ‘the water table had to be lowered. Locally, it was lowered even more for the cultivation of certain crops. And when shortages arose, water was pumped in from the major rivers. Water from the Maas keeps the whole of eastern Brabant and central Limburg irrigated, and water from the IJssel even supplies the eastern Netherlands!’

House of cards

In effect, a house of cards has been built, in Verdonschot’s opinion. And that house of cards is now collapsing. ‘The hot summers mean that much more water evaporates, and there is much less precipitation. And when it does rain, it does so over a very short period of time, so that it runs off and evaporates quickly. On top of that, due to climate change, the supply of water via the large rivers is now stagnating. Little supply and no reserves: that results in a shortage. It’s only logical.’

‘We have built a house of cards and now it is collapsing’

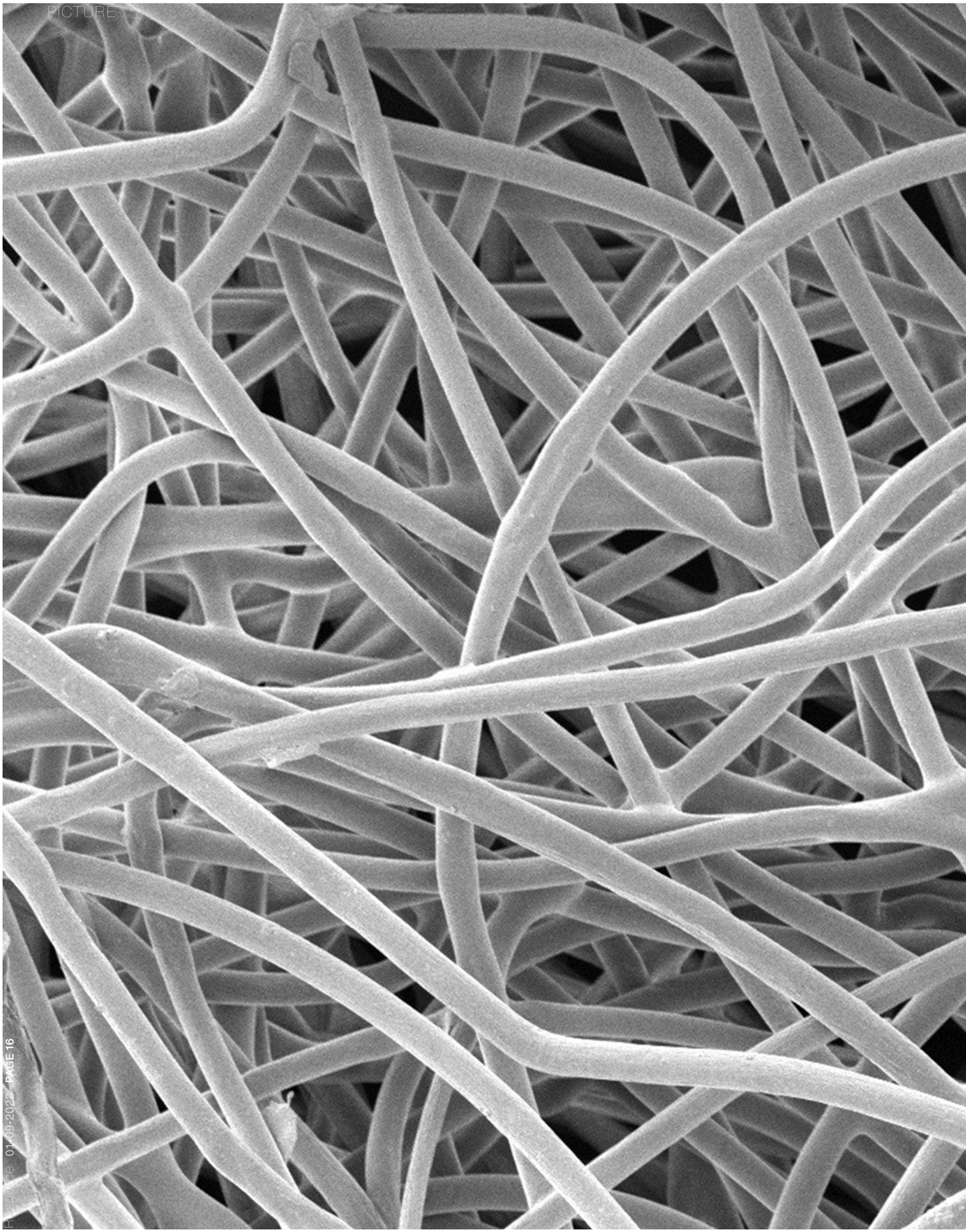
And the solution is equally logical, according to the ecologist: the ‘massive drainage of the landscape’ must be reversed. ‘In my view, many of the ditches and gullies should simply be filled in , because we don’t need them. The same goes for the thousands of kilometres of ditches in the woods. The Netherlands must be redesigned. We are on the eve of “land consolidation 2.0”’.

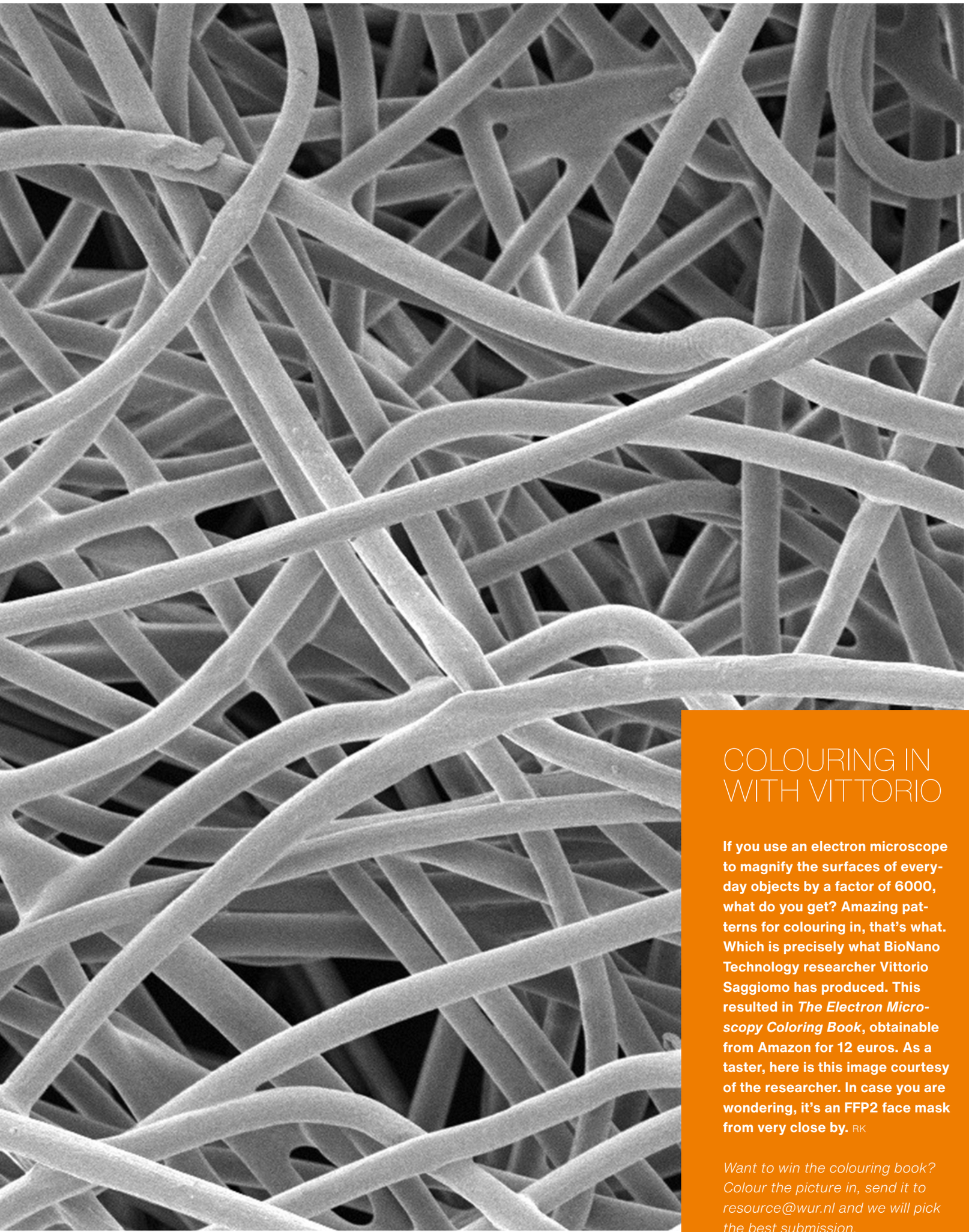
Photo Shutterstock

But this must be an ‘integrated comprehensive land consolidation’, says Verdonschot. ‘And this time not just for agriculture, but taking all functions into account, including water quality, recreation, urban development, nature and so on. And under the strict condition that water gets precedence in land use planning. Function follows water, not the other way round, as has always been the doctrine of the water boards. Building with nature, giving priority to the subsoil for water retention, the valleys and streams for water storage, and the changing climate.’

Agriculture

In this scenario, the farmers will have to make a lot of concessions. ‘Agriculture has got to change radically, but we don’t need to have that discussion any more, surely,’ says Verdonschot defiantly. ‘After the Second World War, the landscape was designed in the interests of agriculture. The aim was: no hunger ever again. But now we must move towards a new realism, and realize that a sustainable world and a sustainable food supply call for a new system.’
To say that this message does not go down well with farmers would be an understatement. But according to Verdonschot, they too will have to be part of the new reality and the irreversible changes that are taking place. ‘We have 52,000 farmers in this country, 2,500 of whom are organic. Three quarters of the remaining farmers see that things have to change. Should the remaining 10,000 plus farmers get to decide for 17 million people what should happen in this country?’ RK





COLOURING IN WITH VITTORIO

If you use an electron microscope to magnify the surfaces of everyday objects by a factor of 6000, what do you get? Amazing patterns for colouring in, that's what. Which is precisely what BioNano Technology researcher Vittorio Saggiomo has produced. This resulted in *The Electron Microscopy Coloring Book*, obtainable from Amazon for 12 euros. As a taster, here is this image courtesy of the researcher. In case you are wondering, it's an FFP2 face mask from very close by. RK

Want to win the colouring book? Colour the picture in, send it to resource@wur.nl and we will pick the best submission.

The student housing market is tight

Every summer we wonder how many new students will arrive in Wageningen needing a room. This year, circumstances make it even harder to predict. ‘We’ve got to think about emergency scenarios.’

Text Luuk Zegers

Stay away if you don’t have a room yet. This was the appeal put out in July by VU University Amsterdam and the University of Amsterdam, among others. It is ‘hard to predict’ how many new students will come to Wageningen, says Ingrid Hijman, head of the Student Service Centre. ‘For example, 160 students from China have applied, but it remains to be seen how many will actually come: it only takes a new Covid-related development for all flights to be cancelled. The war in Ukraine could have an impact too: what effect does a conflict like that have on the world and how does that affect our figures?’ There are some question marks closer to home too, says Hijman. ‘How many of the Dutch applicants will decide at the last minute to take a gap year and only start in 2023, when they will get student grants again?’

Guarantee

These uncertainties make it difficult to make a good prognosis regarding how many of the registered students will actually start a degree here. This prognosis is important, because it is the basis on which WUR reserves rooms for new international students with Idealis and draws up new construction and renovation plans. Whereas other universities have made strong appeals to stay away, WUR seeks to arrange a room for every new international student, a room guarantee of sorts. Hijman: ‘Not really a guarantee, but Idealis makes sure there are always 850 vacant rooms for new international students in September. The rooms are rented out for two years, after which the tenants have to move out. That way we always have 800 rooms available immediately, and 50 more in reserve for urgent cases. If more international students arrive, as will probably be the case this year, we normally try to reserve extra rooms with Idealis. At the moment, however, there are very few vacant rooms, so we cannot reserve many extra rooms. It’s going to be touch and go.’

‘It has a major impact on your city and public order if 300 more people suddenly arrive’

Emergency scenarios

To ensure that hundreds of homeless international students do not come streaming into Wageningen, Hijman has called for preparations to be made for an emergency scenario. ‘That could be a cruise ship in the Rhine used as temporary housing for students during peak periods. After the peak, they can move on to regular rooms.’ Hijman sees the municipality as having a key role in such an emergency plan. ‘When making forecasts for student housing, they have always focused on the average student numbers throughout the year rather than the demand at the peak time. And the municipality points to Amsterdam, where the university urges inter-

There should be an emergency scenario to prevent dozens of homeless international students from turning up in Wageningen, says head of the Student Service Centre Ingrid Hijman. 'That could be a cruise ship in the Rhine used as temporary housing for students during peak periods.' ◆ Illustration Valerie Geelen

'The situation in Amsterdam is completely different'

national students not to come to Amsterdam if they don't have a room. Whereas the situation there is completely different. WUR teaches courses about world problems such as food security and climate change. If you do that, you must give students from all around the world the opportunity to study here. That is completely different to offering psychology in English at a university in order to make money. Anyway, we need an emergency plan and we will now be working on that together.' Idealis agrees that it is the municipality's task to help think through about emergency scenarios. Director Bart van As: 'It has a major impact on your city and public order if 300 more people suddenly head for Wageningen. We guarantee 800 rooms, but due to a historically low number of vacant rooms, we can't do much more than that at the moment'. A cruise ship strikes him as a good option, but the current emergency plan is that students may have to share a room temporarily. 'But for that the municipality has to draw up emergency regulations and they only do that if they are out of other options,' says Van As.

A room for everyone

Besides providing a roof over the heads of all new international students, Idealis also sets itself the goal of housing all Dutch students who are looking for a room by 1 May. They didn't manage that last year, Van As explains. 'On that date, there were still 100 students interested in various rooms. We don't know whether these were all students without a room or whether they including people wanting to move on to better rooms.' This year again, it remains to be seen whether all students will have a room by 1 May. 'If all goes well, the new building at Costerweg 65 will be completed before Christmas, which will make 265 more rooms available. If you add the 100 from last May to the expected additional influx, we should be fine by 1 May 2023. But that forecast is based on normal years.' Despite the current uncertainties, Van As is satisfied with how Wageningen

is doing when it comes to student housing. ‘We are the only university town that gives international students the chance to rent a furnished room for two years. In other towns, they get six months or a year, after which the students are responsible for their next room, based on the assumption that by then they have built up a network and can arrange something themselves. But of course, it’s not like that in reality in the current market’. The idea behind the two-year contracts is that you can complete a Master’s programme in that time, Van As says. ‘If that doesn’t work out, that’s not necessarily a problem either. You’ll have to leave your room, but by then you’ve been registered long enough to find a new one in the regular system.’ Dutch students are relatively well off here too, says Van As. ‘No other city guarantees them a room by 1 May. And we didn’t quite manage that last year either, but it is our aim and our building plans are in line with it. And we expect to succeed again this year.’ So the situation in Wageningen should be seen in the right perspective, says Van As. ‘In Amsterdam there is a shortfall of 20,000 rooms, here it’s 100.’

New builds

Nevertheless, it is important that the building plans go ahead, says Van As. ‘The total number of WUR students is still increasing thanks to several consecutive years of a growing intake. It is therefore important that we make headway with the new building projects’. In addition to Costerweg 65, there will be a student residence on Marijkeweg 20 – the old catering school. ‘Not an Idealis building, but it will be student housing,’ Van As says.

‘For a cruise ship the municipality has to draw up emergency regulations’

‘We are also working on Bornsesteeg 2.0 (400 units) and Born Oost, a project on the Mansholtlaan (250 units). Altogether, that should be enough to house all the students in the coming years. But building is a pretty complicated business these days, so nothing is certain. In the meantime, the star-shaped flats that are so typical of Wageningen, the first of which (Asserpark) dates back to 1969, are due for an update. Van As: ‘Firstly, we are going to make them more sustainable and secondly, we want to bring them more in line with what today’s students want. In Dijkgraaf, for example, there are units with 10 and 18 residents. We want to convert them into units with five or six residents and a nice communal area.’ When that is to happen has not yet been decided. ■

A response from the municipality

In a response to this article, a spokesperson for the municipality wrote: ‘It is the shared ambition of the municipality, Idealis and WUR to ensure that everyone has a room by 1 May. And Idealis will make provision for a peak period of high demand. Each year, WUR, Idealis and the municipality make an estimate of the expected number of students and the fresh supply of student rooms. The picture that emerged from the last prognosis this spring was that the student room market is quite relaxed, and there may even be moments when there are vacant rooms. But there is always a peak in the demand for rooms at the beginning of the academic year, as is currently the case.

Recently, it appeared that there may be a larger influx than expected. So Idealis, WUR and the municipality are now exploring the options so we can cater for the international students.

Because student recruitment is so hard to predict and depends on many factors, since 2021 we consult with WUR and Idealis on how to respond to the peaks and dips in demand for student housing. We will continue to do this together in future and will also look at possible emergency scenarios.’

THE SIDE JOB

You've got to make ends meet somehow. We can all borrow from Uncle DUO, but there are also students who earn money in surprising ways. In this series, we discover some unusual side jobs. This time it's vegan Djordi Soet, who helped cull chickens. Text & photo Steven Snijders

Vegan helps cull chickens

Who: Djordi Soet (24)
What: Culling chickens after a bird flu outbreak
Why? Culling chickens is a gruesome job that is not for the faint-hearted.
Hourly wage: €19.06 (gross, 200 per cent on Sundays)

'When bird flu is diagnosed in a barn, the chickens are culled. They are first gassed and then removed. You get protective clothing, including a gas mask, and you get a flu jab. The jab is a precaution to reduce the risk of mutations. We'd be even worse off if the bird flu virus became more infectious to humans, or vice versa. Afterwards, the protective clothing is burnt and you have to shower before you can leave the premises. It is very demanding physically. It puts a lot of strain on your back and you sweat incredibly in those clothes. Yet I really wanted to do this job. I am interested in the ethical questions surrounding our food system. I have been a vegetarian for six years and I recently became a vegan. In my International Development Studies degree programme, you learn about the "participatory observation" method. It helps you gain a better understanding of a phenomenon by experiencing it yourself. This approach to learning inspired me to do this work. It is a bizarre experience to go into a barn and dispose of over 100,000 dead chickens. You grab several chickens at a time and throw them into a wheelbarrow. Sometimes you stand on a chicken that still has air in its lungs, and a last cluck comes out. And yet it didn't make much impact on me at the time, as it all starts to feel a bit surreal. Some of my colleagues were farmers themselves or had family with a farm. On my second day on the job, I started talking to them more and I mentioned that I am a vegan. It was interesting to discover that we agreed on a lot of issues. Activist groups like Wakker Dier and poultry farmers are often on opposite sides, but I think they are potentially allies. I also learned that poultry farmers have set up their own fund to help farmers financially whose chickens have been culled. My colleagues asked me: what is it like to do this as a vegetarian? But I know that at least I am not contributing to it, since I am a vegan. So I asked them: what is it like to do this work as a meat-eater?'

'Sometimes you stand on a chicken that still has air in its lungs, and a last cluck comes out'

Do you have an unusual side job or know someone else who does? Send an email to steven.snijders@wur.nl

A burger out of the printer

‘WHY DO WE WANT TO IMITATE MEAT?’

Researchers at WUR have developed a process for printing a vegetarian burger. The burger is made up of spaghetti-like threads of protein.

Text Roelof Kleis

In the process hall of the Axis campus building stands BEP. Or Beppie, as the machine is affectionately called in the workplace. The abbreviation stands for Burger Extrusion Printer, one of the first of its kind in the world. This fulfils the wish of an anonymous donor who gave WUR one million euros to develop the machine nearly two years ago. The generous donor’s assignment was clear: design a 3D printer that can make a meat substitute out of plant protein.

And can Beppie do that? A cautious ‘yes’ is the answer from project leader Laurice Pouvreau. ‘We have made progress insofar as we can make fibrous structures from plant-based material with a 3D printer. And from these fibrous structures we can make threads with which shapes can be printed.’ And yes, it has really been used to print a burger. But it is not as though the printer has already gone into mass production of veggie burgers in the process hall. In fact, Beppie is currently unemployed and waiting for some follow-up. The private funding is finished and a proposal for a follow-up project is waiting for the green light. Pouvreau believes there is every reason to take the project further.

Biefstuk Bali 0.0

WUR was not the first past the post, though. That was the Israeli company Redefine Meat, which made a splash with the first cuts of printed meat last year. Recently, their product has been on the menu at several branches of the Dutch restaurant chain Loetje (including Nijmegen) under the name Biefstuk Bali 0.0. Animal-free meat, hence the 0.0.

How Redefine Meat makes the meat is not clear. More is known about the Wageningen approach, although details are withheld because of patent applications in progress. But Pouvreau explains that the basic steps are comparable with techniques such as extrusion and shear cell technology (a process from Wageningen) for making fibrous structures from vegetable protein. ‘It is a combination of heating and cooling,’ Pouvreau explains. ‘You have to heat the material to unfold the proteins and create the fibrous structure. Then you have to cool it down to fixate that structure. What we have fine-tuned is the time the material spends being heated and cooled, which is less than a minute in our process. That is very short compared to an extruder (three to five minutes) or a shear cell (up to 20 minutes).’

So far, the printer has mainly been working with bean protein ingredients. Bean protein isolate, beans in processed form, is the raw material that goes into the printer. It is then pushed under pressure through a narrow tube of a few millimetres in diameter, heated and cooled. This process produces printable threads. Pressure and temperature have to be adjusted very precisely, says Pouvreau. ‘You have to strike a balance between printability and the right bite and flavour.’ As far as flavour is concerned, the printing process has a surprise up its sleeve. What comes out of the printer turned out

to taste a lot better than expected. Pouvreau: 'Beans that come out of an extruder without addition of flavour do not taste very nice. Post-processing is needed to make palatable meat alternatives. With our printer, that is not necessary; you don't get much of a beany taste.'

Crucial

It's not entirely clear yet why the printing process improves the flavour. 'It probably has something to do with heat transfer and short residence time,' says Pouvreau. 'We push the protein through a very narrow tube. That ensures efficient heat transfer so the fibrous structure is created in a short period of time. How a product tastes is closely related to its texture. The texture we create is probably different from what an extruder delivers thanks to that short heating time.'

Crucial factors for the flavour of meat are its bite and its juiciness. Existing veggie burgers are often no match for meat when it comes to these qualities. Beppie's solution to that lies in a 'coaxial' printing method. 'That means we insert the juice into the printing thread,' explains Pouvreau. 'In effect, we print two things at once: a firm exterior resulting in the bite experience, based on protein, and a soft interior, based on an emulsion. This makes the product juicier and more appetizing once it is cooked, so it is more like beef and pork. If you cut into the thread, you can see the emulsion. It looks like spaghetti with a filling inside it.'

'VEGGIE BURGERS ARE AN INTERMEDIATE STEP: THEY LOOK LIKE SOMETHING THE CONSUMER IS FAMILIAR WITH'

Intermediate step

It is this last development in particular that Pouvreau and her colleagues are keen to research further with new funding. And as far as she is concerned, the development should not stop with vegetarian burgers that imitate meat. 'Actually, I want to get away from the idea that the end product must taste like meat. It should taste like something plant-based. Plant protein is different from animal protein, so why would we want to simulate that? But it will take some time to convince consumers that plant-based products are good by themselves. It will need a new generation. Veggie burgers are an intermediate step: they look like something the consumer is familiar with. Hopefully we can then move on to plant-based food with a niche of its own on the market'. ■

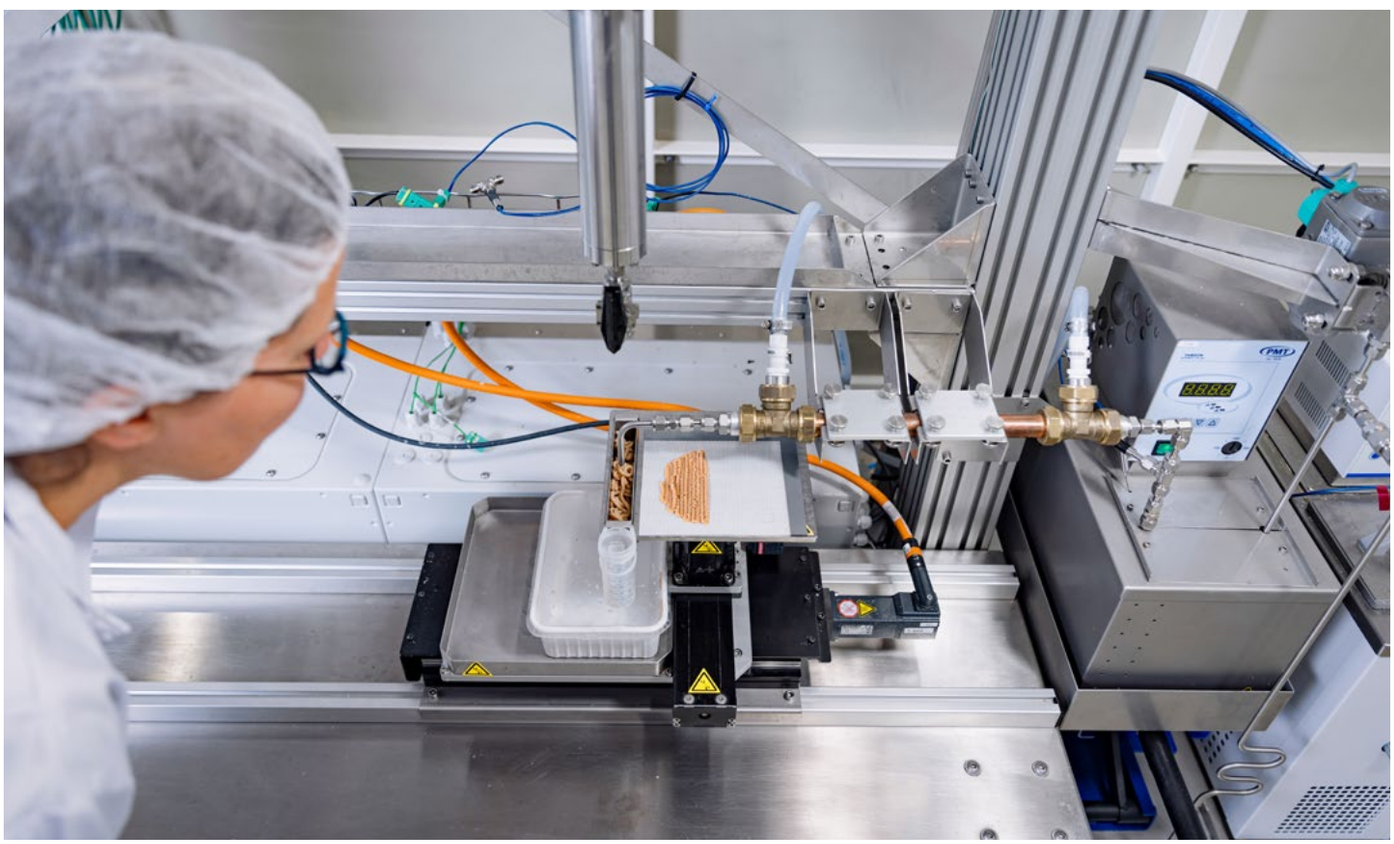


Photo Eric Scholten

Imke de Boer makes the change

FROM ANIMAL TO PLANT

Personal Professor of Livestock and Sustainable Food Systems Imke de Boer aims to become a vegan. She wrote a book about that life change: *Past het dier nog op ons bord* (Do animal products still belong on our plates)? Text Roelof Kleis

To start with a spoiler: the answer is 'no'. Well, Imke de Boer's answer is 'no'. 'But it is an ethical choice,' she adds, 'and I can't make that choice for others. I do hope that people who read this book will think about that choice.' That hope seems to have been fulfilled: the first print of the book, 750 copies, is already sold out. 'And I am proud of that.'
In the book, De Boer describes her growing personal struggle with intensive livestock farming. It began during her Zootechnics degree course in Wageningen in the 1980s. 'I actually wanted to become a vet, but I didn't win the lottery for a university place for veterinary sciences. Zootechnics was the standard alternative in those days. While I was at university, I had an uneasy feeling about the emphasis (in those days) on increasing production.' But she suppressed that feeling and finished her studies. And even went on to do a PhD in the Animal Breeding and Genetics group about cloning embryos in the interests of even higher production.
'I had a great time there,' says De Boer emphatically. 'But during the PhD project I kept thinking: what am I actually doing? What is the goal here? After my PhD, I opted to move to the new Animal Production Systems chair group that was working on sustainability in animal husbandry. There I found the holistic vision I was looking for and critical questions were being asked about eating animal-based food.'

Still, it took another 30 years before you bit the bullet and said: I want to become a vegan. Why only now?

'That sort of thing grows over time. It has been a slow process. I grew up in a meat-eating environment. There was no question of whether you should eat meat in our home. What's more, it was seen as important for me to eat well because I played hockey at a high level – I even made it onto the junior national team. I have been a vegetarian for a long time, by the way. It's not at all difficult to give up meat. But I find the step to veganism extremely difficult. You have to create completely different kinds of meals. And there are other people around me. When you make a choice like this, you ask a lot of others too. So I'm not a vegan yet, but I hope to get close to being one.'

What was the deciding factor in wanting to be a vegan?

'The ethical aspect. Is it acceptable for us to keep animals, define their interests and needs, and ultimately kill them to eat them? I find that increasingly difficult to justify to myself. And of course, this issue affects the dairy and

'IT'S NOT AT ALL DIFFICULT TO GIVE UP MEAT, BUT I FIND THE STEP TO VEGANISM EXTREMELY DIFFICULT'

Photo Maurits Giesen

egg production chains too. Milk production is inextricably linked with meat production. So not eating meat but still eating dairy and eggs is schizophrenic, to my mind. That is why I think I should become a vegan.'

A quarter of the Dutch population believe that animals and people are equal. Yet only one and a half per cent are vegans. How can that be?

'It is a kind of cognitive dissonance: you think animals are equal but you still eat them. I did that for years too, even though it didn't feel quite right. You can say: how silly of you only to make that choice now. Or you can turn it around: how honest of you to say so. I don't think I'm the only one who struggles with these things. And not everyone has to become a vegan, as far as I'm concerned. If we all ate fewer animal products, we could take giant steps towards a sustainable future.'

You advocate making veganism the norm. So meat would be the exception?

'I advocate changing the food environment. It needs to become easier to make plant-based, sustainable choices. At the moment, if you have lunch somewhere, you have to indicate that you are vegetarian or vegan. It should be the other way round. I'm glad that we, as a green university, are taking the lead in this, with a large and tasty range of plant-based products.'

Much WUR research still focuses on increasing production: the boundaries for animals are increasingly being reached and stretched. Should WUR also think about whether animal products still belong on our plates?

'I would be delighted if the book prompts a discussion about that. Values and norms are changing all the time. What does this mean for the Animal Sciences degree programme, for the curriculum and for research? If you think that people and animals are equal, what does that mean for the field of animal sciences? What does the young generation coming to study here think about this? What sort of research do we consider ethical and what not? What do we stand for? I see research that makes me think: you shouldn't be doing this anymore. I think it is important that we at least think about that. And we're not doing that enough yet.' ■

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Researchers back from Spitsbergen expedition

NO LACK OF POLAR BEARS

This summer, a group of scientists spent 10 days studying the effects of climate change in the southeast part of the northern archipelago of Spitsbergen. They are back now, and *Resource* talked to two researchers from Wageningen Marine Research. Apart from concern about the changes taking place, their foremost feeling was awe at the wilderness they experienced. Text Stijn Schreven

'I sat in the nicest spot on the ship, looking out over a sea covered in birds waiting to be counted.' This is how Susanne Kühn, a bird researcher at Wageningen Marine Research, describes her experience of the Dutch expedition to Spitsbergen in July. She was one of the 50 scientists who travelled on the ship *Ortelius*, in the company of 50 tourists, to do research on climate change in the south-eastern part of the Norwegian archipelago. Most of the scientists have returned now, although some of their samples will only arrive in the Netherlands by ship in the autumn. Kühn counted seabirds and marine mammals from the bow of the boat, where she had a small viewing hut with a bench and a table. Kühn could count whenever the boat was sailing. Because the scientists and tourists went ashore during the day and the boat could not sail then, she mainly counted at night. 'That's no problem when there are 24 hours of daylight. It is a beautiful feeling of solitude. You are alone with your birds, tired but very happy at the same time.' She was helped occasionally by tourists or colleagues.

The route taken by the ship *Ortelius*. ©Oceanwide Expeditions

Kühn's counting sessions went on as long as the boat was moving and there was visibility, sometimes for six to seven hours. 'I was able to put in a lot of hours.'

Polar bears

It was a different matter for researchers who had to go ashore for their work. There was no shortage of polar bears. One was sighted nearly every day and when that happened, they had to relocate to go ashore, for their own safety. But there was no disappointment in that for Sophie Brasseur, seal researcher and a colleague of Kühn's at Wageningen Marine Research. 'I loved the polar bears,' she says. 'I'd be happiest if there were be so many polar bears that we couldn't go ashore at all, and for the area to be left in peace to defend itself against climate change as best it can. The increasing influx of tourists doesn't help in that regard.'

She learned a thing or two from the previous research trip in 2015. 'I realize that it is useful financially, but doing research with tourists on board is not optimal. Last time, the scientists had extensive plans but were given too little time because the tourists are entitled to their outing as well. So this time I set a minimal goal that can be achieved in a short time.'

She surpassed that goal and collected 13 walrus turds instead of the planned 10. At around 1000 kilos, the walrus is one of the largest species of fin-footed (seal-like) animal in the world. To collect the poo, she had to get very close to resting groups of about 50 animals. An overwhelming experience. 'They are like trucks, such huge

Sophie Brasseur collects walrus poo for eDNA analysis of their prey. ✦ Photo Susanne Kühn

animals. They could gobble me up. That such giants can exist – precisely because we leave them alone – is astonishing.'

Frozen faeces

The walrus and other seals are the 'thermometers' of the Arctic, says Brasseur. 'Seals are totally dependent on the sea, but they come ashore. You can see from them whether the system is changing. You can tell from their faeces what prey is available; you can tell if there is enough prey by how many pups they raise. They take samples from the sea for us.' The droppings are frozen and will come to the Netherlands on the Ortelius in the autumn. Then the researcher will isolate the DNA of the walruses' prey from the droppings and use eDNA techniques to see what the animals have eaten. She will compare that information with samples of marine life collected during the expedition in 2022 and faecal samples from the previous expedition in 2015.

Susanne Kühn's counts provide another yardstick for the health of the Arctic. Apart from the walruses, she saw hardly any marine mammals from the observation hut on the bow. 'There were very few where there used to be a lot. Hardly any whales, just the occasional blow from a large whale in the distance.' Yet she cannot tell first-hand whether there has been any change, because she has not been to this part of Spitsbergen before herself. 'It's mainly what other researchers tell you. On the last expedition there was still sea ice, and now it has gone completely.'

Plan of attack

There were once thousands of walruses on Spitsbergen, but they were massacred for their ivory tusks about 100 years ago, Brasseur explains. Now their numbers are growing for two reasons: the population is recovering and walruses from the Arctic are migrating to Spitsbergen and other coasts because the sea ice is retreating. The melting sea ice is also creating new threats: more and more companies are encroaching on the archipelago. 'Tourism, fisheries, oil companies and shipping can now make more use of the Arctic,' Brasseur explains. 'The governments of the polar regions should protect more areas for animals like walruses, because what if an oil tanker or container ship loses its cargo?'

Brasseur thinks a new 'plan of attack' is needed for future expeditions. 'What can Dutch scientists do for Spitsbergen and polar research? We must make sure that research fills the gaps in our knowledge better.' The seabed and marine life in the polar regions, for example, has not yet been properly mapped. Brasseur: 'Melting ice brings cold, fresh water into a saltwater system. We don't know what the consequences of that will be.' While the focus of this expedition was mainly on land and lakes, she would like to see the next one dive into the sea to identify those consequences. ■

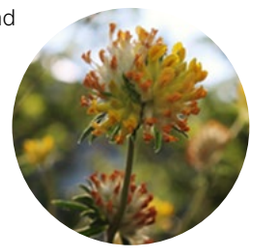
'DOING RESEARCH WITH TOURISTS ON BOARD IS NOT OPTIMAL'

Flower hunting

In this series, student editor and Master's student of Plant Breeding Julia van der Westhuyzen (photos and text) and Professor of Plant Ecology Joop Schaminée (stories) go looking for the loveliest campus flora.

Kidney Vetch

Common name: Woundwort, or Kidney Vetch
Scientific name: *Anthyllis vulneraria*
Flowering time: June to September
Campus location: in the garden at Lumen



'Both the scientific name and the common name of this plant suggest its healing properties – *vulneraria* means wound healer. This is because the leaves, roots and flowers of the plant contain antibacterial and antioxidant properties, so they can be used in both fresh and dried form to heal skin wounds and rashes.
'Parts of this plant can also be taken internally to relieve stomach problems and throat pain. The healing power of this plant is not limited to human applications. The roots also have a symbiotic relationship with nitrogen-fixing bacteria. Through this relationship, nitrogen can be absorbed and supplied to the plant itself and the plants around it. The plant is also very popular with bees, butterflies and caterpillars.'

Pretty but useless

'Seeds from this plant are often included in packets of mixed seed. Such flower seed mixes seem like a nice idea but they contain mainly cultivated seeds from plant-breeding programmes, rather than indigenous varieties. So they do more harm than good because they do not provide food for insects and are of solely aesthetic value. They can also cross-pollinate with wild flower varieties and change the genetic properties of the wild variety.' AS

You can find all the flavours of the world in the WUR community. Paola Cassiano, an MSc student of Plant Sciences from Italy, shares a recipe for stuffed tomatoes.

Smaken van WUR

Pomodori ripieni gratinati

'Since I love vegetables, and especially tomatoes, my boyfriend's mum always cooks this recipe when we visit her for lunch. It's simple, quick and delicious! The original dish is made with Parmesan cheese, but I prefer the vegan version since it's more sustainable and still very tasty. This meal can be eaten either hot or cold, and any leftovers still taste great the next day.'

Ingredients (for two persons):

- 800g beef tomatoes
- 80g breadcrumbs
- Extra virgin olive oil
- Black pepper & salt
- Oregano
- 2 cloves of garlic, chopped

1. Wash the tomatoes and cut them in half.
2. Spoon out the tomato flesh and blend it with salt, oregano, black pepper and chopped garlic. If you don't have a blender, just chop the tomato flesh with the seasoning.
3. Add the breadcrumbs to the mixture and stir it. The result should be firm but creamy.
4. Fill each tomato shell to the brim.
5. Drizzle olive oil over them.
6. Place them on a tray covered with baking paper and bake them in a preheated oven at 180°C for about 30 minutes.
7. Take them out of the oven, let them rest for five minutes and... enjoy!

Paola Cassiano
MSc student of Plant Sciences from Italy

10-euro lunch voucher
Share your recipe with *Resource* and get an **Aurora voucher worth 10 euros.**
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Art with protein

Remco de Kluizenaar spent a year on campus as the artist in residence. The sound artist spoke to numerous scientists and incorporated those encounters in artworks. His final show is a performance for three people Text Roelof Kleis • Photo Bart de Gouw

Resource saw the performance last week in the premiere with about 30 scientists. In this show, De Kluizenaar takes his audience on a tour of the history of the Earth. That includes the origins of life and the indispensable proteins, but also the human race and its current conflict with the planet. The audience have bit parts too, when he explains how our red blood cells work. Probably not necessary, but still fun.

As we walk from location to location, De Kluizenaar makes clever use of the campus. For example, it is precisely 464 metres from the information board on Droevendaalsesteeg to Bornsesteeg, which, if each metre represents 10 million years, happens to give the age of our planet!

Climax

De Kluizenaar is a sound artist. He already produced an audio tour about the protein transition earlier this year. In *Everything is Connected* (the title of this current work), his sound skills lead to the climax of the performance when the complexity of the transition from animal protein to vegetable protein drives him to despair. He literally lets the audience experience the many different voices in his head.

But the despair turns into catharsis. Behind Actio is a tree that fell down in May. The storm damage symbolizes the state of the planet and biodiversity. This is where De Kluizenaar finds his release and reaches a conclusion after a year at WUR. We have to listen to the planet, put our heads together and each take responsibility. Not a surprising conclusion, but very true nonetheless.

Everything is Connected can be seen on 7, 9 and 10 September. Tickets (6 euros, free for WUR staff and students) can be obtained at remcodekluizenaar.nl

Scene from *Everything is Connected*, with Remco de Kluizenaar on the right.

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AID WILL BECOME AAD

The AID committee has had enough of the annual introduction days and makes a plea for a final week instead: the Annual Closing Days (abbreviated to AAD in Dutch).

'It's the same story every year,' says Maurits de Hond, chair of the AID committee. 'In August, we go all out to welcome new students to the town and the university. That's fine for those first-years but what's in it for you when you've been here a while? You know the town back to front anyway.'

Then there is the fact that the number of old-timer students far outnumbers the AID students, as De Hond points out. 'In this day and age you can't justify preferential treatment for one group of students simply because they are new. We want to make AID an inclusive event. If we replace the introduction week for newcomers with a closing week for all students, *everyone* will be able to let their hair down at the end of the academic year.'

There are other advantages too, explains De Hond. 'AID is often at the same time as Lowlands pop festival. That's not handy, especially if you already had tickets. If we move AID to early July, we will be able to party in Wageningen and then again at Lowlands. Win-win.'

De Hond thinks new students will support the change. 'Of course they will have to get used to the idea of finding their own way, but on the other hand they get a great party week in return.'

It should be noted that no decision has been taken yet on AAD. WUR's President Houkje Sjeimovaara says in a statement that she is 'open to a new format for AID' but a 'broader debate' is needed first on the substance of the new event. 'We will set up a working group to examine the AID committee's proposal.' The working group will meet weekly from September onwards, on Friday evenings in café Onder de Hazelaars.