WUR from within: straight, sharp, transparent

No 13

# Resource

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The journalism platform for all at Wageningen University & Research

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## FOREWORD

## Despair

‘To be honest, I’m scratching my head. Here we are in the Mecca of agricultural expertise, the dialogue on these topics has been going on for some time and we still haven’t got a clue.’ This heartfelt comment was heard this week in Omnia, where a diverse group of stakeholders in Dutch agriculture, the food industry and nature gathered at the invitation of WUR. The aim was to discuss new prospects for the future with one another and with the team behind the now famous *Dilemmas* document. It was a positive event in terms of the good intentions and the atmosphere in which the discussions were held. There was even surprising agreement on certain issues. In particular, many were united in having dramatically low expectations of what politicians would achieve in this domain.
It reminded me of two interviews I did recently. One was with Rural Sociology professor Han Wiskerke, who also criticized the lack of prospects, of not having a clue — see page 12. The other — we are still writing that article — was about the role of science in the formulation of the EU’s agricultural policy in Brussels. I sometimes wonder whether WUR shouldn’t do much more to explain to politicians in The Hague and Brussels how much harm the failure to make choices is causing. I can already hear mutters of ‘it’s not our role’, and there is something to be said for that. But how much more despair in the eyes of reasonable people can we bear?

**Marieke Enter**
Editor


# TRADITION

**On Dutch National Pancake Day last Friday, three WUR students baked pancakes for the residents of the Bosrandweg Asylum Seekers' Centre in Wageningen. Initiators Sheng Groen (not in the photo), Duco Doorenbos (in the foreground) and Nando Gosen (in the background) wanted to give the residents a warm welcome and introduce them to this traditional Dutch delicacy. They arrived at the centre armed with 60 eggs, 10 kilos of flour and 20 litres of milk.**

**'We were cooking for about two hours straight. The children living in the centre came and helped us. They were very enthusiastic. Everyone was really grateful and all the reactions were positive,' say the students. They used about half the ingredients and donated what was left over at the end to the centre. The Bosrandweg residents are not in the photo for privacy reasons.** DV

Photo María Joaquina Acosta

# MPs shocked: no right to permanent rent contract for students

**Last year, the Dutch Parliament decided students should get the right to a rent contract for an indefinite period. But Housing minister Hugo de Jonge knocked that plan on the head. MPs realized this too late.**

The Permanent Tenancy Contracts Act was passed last year by the Lower and Upper Houses of Parliament. As of 1 July, tenants will get the right to a contract for an indefinite period. An amendment by the political parties D66 and SP was intended to make sure the act also covered student accommodation. But Housing minister De Jonge prevented that change. A month ago, he informed Parliament that students would only be covered by the legislation in exceptional cases. Originally only international students would be excluded, but the minister said that would violate European rules.

MPs realized too late that De Jonge had changed course. Any such 'order in council' is automatically accepted after 30 days. SP, D66 and SGP tried to stop it using an emergency procedure on the day of the deadline, but they failed to get the necessary 30 votes in the Lower House.

## The dupe

Students are the dupe, says MP Jan Paternotte (D66). 'This means they will continue to hop from one temporary rental contract to the next, which puts them under a lot of stress when all they want is to focus on their studies.'

The Tenants' Union fears landlords will make full use of students' exceptional position. 'Now they will be able to offer everyone who is registered with an educational institution a two-year contract. Landlords are obviously allowed to offer a contract for an indefinite period, but unfortunately we know from experience they prefer not to.' HOP

*'Landlords are allowed to offer a contract for an indefinite period, but we know from experience they prefer not to.'* ◆ Photo Shutterstock

# No new 'consent lessons' for first-year students

The recommendation made recently by government commissioner Mariette Hamer to introduce 'Sex and relationship education' as a standard element in the curriculum for first-year students has not yet led to any new initiatives in Wageningen.

'WUR already does a lot on this topic, with compulsory online modules for first-years on personal safety and various other initiatives,' explains head of Student Services Ingrid Hijman. She thinks the main thing is to get people talking about this issue and to give students pointers. WUR has already taken various measures to achieve this. 'It is also debatable whether a compulsory lecture is the right solution for the problem,' says Hijman.

That does not mean nothing is being done with Hamer's suggestion. According to Hijman, the coordinating group on social safety is studying and discussing the report in greater detail. 'There is also always the question of where the university's duty of care starts and ends.'

## Consent workshop

Let's Talk About Yes Wageningen (LTAY) thinks that is not good enough. The campaign group has been advocating compulsory 'sex and consent lessons' for some time, for example in the form of the workshop given by the Gelijkspel foundation. 'WUR says that's difficult, in part because it requires a change in the compulsory curriculum, which is a task for the Board of Education. But we say: difficult is not impossible,' says LTAY spokesperson Judith Rommens.

The Gelijkspel workshop is run occasionally at Wageningen. WUR arranges sessions to help student societies prevent transgressive behaviour, for example. The workshop covers aspects such as how and when to check for consent in ways that avoid misunderstandings. And the fact that going back to someone's house doesn't mean you have agreed to have sex with them. The recent rape case in the Utrecht student scene was a painful reminder of how wrong things can go in such situations. ME

# 123

‘I am proud that 123 years after the first female student, we can welcome the first female rector,’ said President of the Executive Board Sjoukje Heimovaara last week at the *Dies Natalis*. That first student, Miss E. Berkhout, started her degree in Dutch Agriculture back in 1901. Not at WUR, but at one of its predecessors, the State Agricultural College. CJ

## Apply extended reality for free

Last Wednesday, the WANDER Lab presented its XR Pilot Programme during the first edition of XR Day. ‘We want to make it as easy as possible for colleagues to use extended reality technologies,’ says project manager Thomas Ginn. ‘In this pilot project, we remove the financial obstacle by making our time available for free.’
Colleagues can submit their ideas for applying extended reality in research or education, and WANDER will then choose three projects to carry out with them in partnership. ‘In return, we expect the colleagues to invest roughly as many hours in the project as we do and we expect them to be serious about using the technology.’ DV

# Women in charge at six universities

**Six of the 14 Dutch academic universities have a woman in charge and the same applies to half the applied universities. This news came from the Higher Education Press Agency to mark International Women’s Day on 8 March.**

It seems as if the glass ceiling has all but gone for university executives. While they were a rarity in the past, now a lot of women have made it to the most senior positions in Dutch higher education. Eighteen of the 36 universities of applied sciences have a female president and 18 a male one, so women make up exactly half. That is not the case for other board members: 16 of them are women and 30 are men. This is including a few interim board members.
Six of the 14 academic universities have a female president and seven a female rector. Looking at all board members, 20 are women and 21 men. Incidentally, two of the eight male presidents are also rectors.

| University | President | Rector | Other board members |
|---|---|---|---|
| TU Delft | ♂ | ♂ | ♀ |
| TU Eindhoven | ♂ | ♀ | ♂ |
| Twente | ♂ | ♂ | ♀ |
| Wageningen | ♀ | ♀ | ♂ |
| Groningen | ♂ | ♀ | ♂ |
| Utrecht | ♂ | ♂ | ♀ |
| Erasmus Rotterdam | ♂ | ♀ | ♀ |
| Leiden | ♀ | ♀ | ♂ |
| Maastricht | ♀ | ♀ | ♂ |
| UvA Amsterdam | ♀ | ♂ | ♂ |
| Open Universiteit | ♀ | ♂ | |
| Tilburg | ♂ | ♀ | ♀\|♀ |
| VU Amsterdam | ♀ | ♂ | ♂ |
| Radboud Nijmegen | ♂ | ♀ | ♀ |

*© HOP. Source: the universities’ websites*

Dutch boards have a lot of women compared with other countries. The *Times Higher Education* magazine looked at the top 100 universities in its rankings and counted 50 female presidents, a quarter of the total.

Fifteen of the 56 American universities in the top 200 have a woman at the top (27 per cent), and nine of the top 25 British universities (36 per cent). HOP

# ‘End links with Hebrew University of Jerusalem’

**A petition started by WUR staff calls on the Executive Board to end research and education links with the Hebrew University of Jerusalem (HUJI) and other Israeli universities and institutions ‘involved in the illegal settlement of Palestinian territory and the violation of international law’.**

‘We are concerned that by collaborating with these institutes, WUR is undermining its own high ethical standards,’ says co-initiator Joost Jongerden, an associate professor of Rural Sociology. He says the petition now has almost 170 signatories. ‘It has been signed by people in various science groups, from secretaries to professors. In other words, there is broad support.’
The petition, which can be found in various groups on the intranet, follows the recent statement by the Executive Board on WUR and the dialogue concerning Israel and Hamas. Among other things, the Executive Board says WUR should not be taking an explicit position on geopolitical conflicts that have little to do with research or higher education. That WUR did this nonetheless in the Ukraine conflict was mainly because of the explicit and urgent call to do so from the minister of Education, says the Executive Board.

**‘We are concerned WUR is undermining its own high ethical standards’**

## in the Occupied Territories

The statement prompted criticism. For example, Mark Vicol (assistant professor of Agrarian Sociology) explained in detail on the intranet why this conflict *is* relevant to research and education. The petition, which Vicol also helped set up, also deals with this question.
It refers for example to WUR’s exchange programme with HUJI; much of HUJI’s campus is built on occupied territory. ME

# Graphic novel on space gardens

**Exo-biologist Wieger Wamelink has been researching the possibilities for agriculture on Mars for a decade. Now he has a graphic novel on the topic.**

The book *ExoGARDENS*, which he created in partnership with the artist Anna Vershinina, is the result of the BAD Award the two won last year. BAD, which stands for Bio Art and Design, aims to bridge the gap between art and the biosciences.
Vershinina is a scientist as well as an artist; she is studying for a PhD in Regenerative Architecture and BioDesign at Leuven. The two developed ExoGARDEN, a modular system for vertical agriculture. This consisted of an installation of stacked 3D-printed flowerpots for growing vegetables in.
The plan got them one of the three available prizes of 25,000 euros. That money was used to build the installation, which has been on view since the end of last year in the MU Hybrid Art House in the Strijp S district of Eindhoven. But their collaboration didn’t end there. ‘We soon had the idea of creating a graphic novel as well,’ says Wamelink.

## Dystopian world

Wamelink is a fan of graphic novels and collects them. ‘I have several thousand. I knew Anna did art in this style. So we came up with a scenario about a dystopian world in the near future in which our design is used to grow food.’ Wamelink himself features in the story.
An interesting aspect of the book is that AI was used to create the drawings. Images from the book are projected on the wall behind the installation in MU Art House. Until now, the book was only on sale at the Art House. But the exhibition is ending soon, so Wamelink has decided to sell the book through his website and to publicize its existence. ‘It has been out for a while, but no one knew about it.’ RK

Settlement on Antarctica, an illustration from *ExoGARDENS*, made using AI.

# ANOTHER CHANCE FOR **PULSE TRAWLING**

It is now two years since Pim Boute got his PhD in the Experimental Zoology chair group and he currently works at the University of Groningen. Even so, we have good reason to phone him, as his conclusions on pulse trawling have recently been published in *Frontiers in Marine Science*.

**What is the significance of this publication?**
He has not been inundated with responses, says Boute. 'The fishing industry has a lot of new worries to deal with: high fuel prices, nitrogen, ever more offshore wind farms, and fleet rationalization. I suspect the pain of the EU's ban on pulse trawling has ebbed somewhat.' He hopes Europe will eventually overcome its aversion to this method of fishing. 'Pulse trawling deserves another chance, especially given that there are options for improving and refining the technique.'

Pulse trawler ◆ Photo Jan van der Vis

**So Boute's findings, which have now been peer reviewed and published, are not an argument for a ban?**
Boute found no evidence that this method of fishing harms marine life in terms of the direct effect of the electric field on marine organisms. That does not mean the method will never cause damage, for example due to local overfishing or when pulse trawling in areas that had previously been undisturbed. But that applies to all methods of fishing. Scientific findings have consistently shown that pulse trawling has less of a negative impact than conventional beam trawling with chains.

**Surely it was already known that there was almost no scientific justification for the ban on pulse trawling?**
That's right. Opponents, in particular the French fishing industry, claimed pulse trawling was disastrous for the ecosystem because the electric pulses drove away organisms, or attracted them. 'There is no life left in the seas where pulse trawlers have been operating,' was their criticism. But Boute's results show otherwise. He found that fish demonstrate a behavioural response to the electric field up to 80 centimetres from the electrodes at most, and fish at that distance are likely to end up in the net anyway. He also found no difference in the sensitivity of the dogfish or thornback ray, fish species that have electroreceptors known as ampullae of Lorenzini. In addition, he found hardly any negative effects from the electric pulses on other marine organisms. Various fish species were found not to be affected by internal wounds due to the electric stimulation — with the exception of cod, although Boute expects that effect to be negligible at the population level. Invertebrates that live on the seabed, such as starfish and sea mice, hardly react at all to the electric pulses. ME

## Background

In pulse trawling, the fish (with sole as the target) are driven into a net with the aid of electric pulses. The method was banned after opposition from the French fishing industry in particular. The Netherlands then took the case to the European Court of Justice, arguing the decision lacked scientific justification while insufficient weight had been given to the benefits (less disturbance of the sea bed, less bycatch, lower fuel consumption). However, the Court ruled that the legislator has considerable powers to make its own judgement and does not have to base this on scientific advice. The decision was a major blow for the Dutch fishing industry, which had invested a lot in the transition.

[Live&Learn]

**A botched experiment, a rejected paper: such things are soon labelled as failures in academia. As for talking about them – not done! But that is just what WUR scientists do in this column. Because failure has its uses. This time, we hear from Mojtaba Porbahaie, a Cell Biology and Immunology researcher.** Text and Illustration Stijn Schreven

‘For more than three years of my PhD project, a particular method kept failing, but I persevered. I had written my own proposal, so I was committed to that goal. I wanted to know whether cow’s milk could support babies’ immune systems. I used antibodies from cow’s milk that bind to antigens of RSV, a virus that causes respiratory disease in children. Together, antibody and antigen form an immune complex that immune cells should recognize. I wanted to detect those structures via flow cytometry, a method for counting and analysing cells and particles using lasers. But the process depends on many factors, such as concentrations, acidity, temperature and incubation time. For a long while, I found nothing.

My supervisor encouraged me and he believed it could be done. But after three years, even he was convinced it wasn't going to work. He wanted to drop the idea, but I persisted. I had spent so much time on it that it had to work. I set myself a goal: if it doesn't work in the next three months, I would give up. But then I would do my very best during those three months. Instead of one trial, I did three trials a week. For each trial I tweaked a factor and improved one step. I told myself: there's a chance it won't work, but if I keep going like this, the chances of it working will eventually be higher.

**‘Now I know making mistakes is part of science, but it is never easy to accept such mistakes’**

I discussed the results with my supervisor and he gave advice. Bit by bit, I optimized the test. In the end, it worked. For three years it had felt like a failure. Now I know making mistakes is part of science, but it is never easy to accept such mistakes. The important thing is perseverance, plus luck and advice from colleagues. Keep trying until you get it right.’

# More plastic than thought in immune cells

**PhD candidate Hugo Brouwer uses cell models to study whether minuscule plastic particles pose risks in human intestines. He recently published some new results.**

Microplastics and nanoplastics, broken down from larger pieces of plastic, get into the food chain via land or sea and end up in our bodies. PhD candidate Hugo Brouwer (Toxicology): ‘All sorts of things attach themselves onto these particles, including the proteins in your stomach or intestines. If the plastic particles are then absorbed into our cells, they could cause damage.’

Brouwer used a setup with tubes and containers to simulate the human digestion system and study how various kinds of microplastic and nanoplastic particles behave in the gastrointestinal tract. He started with tubes filled with a salt solution with the same pH value as our gastric acid, then added the plastic particles. ‘I let them incubate for two hours at 37 degrees Celsius, as if they were in the stomach. Then I added replica intestinal fluid, with the proteins and enzymes that are found in our intestines. I left that to incubate again.’

**‘We know the uptake of nanoparticles can lead to inflammation’**

## Sticky plastic

‘Digestive substances in the stomach and intestines caused the proteins to stick onto the surface of the plastic particles,’ explains Brouwer. ‘This increases the uptake of plastic particles by macrophages, which are important cells in our immune system. It is not yet clear what this means for human health, but we know from the literature that absorbed nanoparticles can lead to inflammation.’

One thing Brouwer is clear about: ‘My laboratory study shows that immune cells absorb more plastic particles than was previously though. If you don’t take account of the proteins attaching to the nanoplastics in your estimate of the uptake of these particles, you will underestimate the potential risks to the human body.’ DV

# One in eight Dutch people is obese

**Statistics Netherlands released new data on obesity among people in the Netherlands last week to mark World Obesity Day.**

At the same time, the World Health Organisation also released data on bodyweight among the world population. Both organisations conclude that one in eight adults is obese. Edith Feskens, WUR professor of Global Nutrition, provides some context for these numbers.

'The number of people with obesity in the Netherlands has tripled compared with the 1980s,' says Edith Feskens, professor of Global Nutrition. (The Netherlands Nutrition Centre defines obesity as having a BMI of 30 or more. Your BMI is your weight in kilograms divided by the square of your height in metres.) ◆ Photo agsaz/Shutterstock.com

## Do these numbers shock you?

'No, not at all. The numbers have been rising for years. Obesity is a disease of affluence, and many countries are doing well economically. You could see obesity as an unfortunate side effect. One billion people with obesity is a lot, of course, but it is "only" double the number in 1990. The number in the Netherlands has tripled since the 1980s.'

## Can the tide be turned?

'We began fighting obesity 15 years ago. It is unrealistic to expect a trend like this to be reversed within just a few years. Policies appear to be having an effect, but it's a slow process. Although I had hoped that we would have managed to slow down the rate of increase in the Netherlands, or even stop it altogether.'

## Why has that not happened?

'Our government is afraid to take the drastic measures that we, as scientists, recommend. Measures such as abolishing VAT on fruit and vegetables, introducing a tax on drinks with added sugar, and passing legislation to stop new fast-food restaurants

**'Our government is afraid to take the drastic measures that we, as scientists, recommend'**

opening in the vicinity of schools. In this sense, I don't expect to see a decline in the number of people with obesity anytime soon.'

## Healthy options are not always the easiest choices to make.

'There is a lot of temptation to make unhealthy choices, but it is the consumer who decides what they eat. We know perfectly well how to eat healthily, but deliberately choose not to. It is not my intention to make people with obesity feel guilty, but we don't have to passively accept this.'

## Do you see a future for the popular diet pills?

'I have no problem with this type of medication for people who are morbidly obese and have tried everything else. But these pills are not magic, and we should be very careful about using them. A large pharmaceutical business in the United States has begun selling people these pills directly, without them having to go through doctors and pharmacists. I am afraid everyone who has difficulty losing weight will start asking their GP for these pills. An unhealthy development, if you ask me.' DV

# PhD theses in a nutshell

### Rats in the greenery

Cities are introducing more greenery to combat the negative effects of urbanization. But possibly not enough thought is being given to the fact that the greenery attracts vermin that can transmit diseases to humans. Marieke de Cock captured wild rats in various parts of Amsterdam, Rotterdam and Eindhoven and tested them for the presence of pathogens. Her conclusion? More greenery in cities leads to an increase in the density of the rat population and an increase in the prevalence of zoonotic pathogens that can be transmitted by ticks and fleas, for example. RK

*Zoonotic quests in urban pests: Rodent-borne zoonotic pathogens in changing urban environments.* **Marieke de Cock ◀Supervisor Wim van der Poel**

### Thrips-resistant flowers

Marcella Bovio used new phenotyping methods to see whether some chrysanthemum varieties could be resistant to thrips. She discovered these winged insects behave differently on chrysanthemum cultivars compared with wild chrysanthemums. That made her suspect the protection mechanism in these flowers must be genetically determined. The key could lie in the metabolites that are present. Bovio will be doing follow-up research as a postdoc and hopes to work towards cultivated thrips-resistant chrysanthemums. RK

*Indefence of beauty: exploiting natural variation in thrips resistance in Chrysanthemum.* **Marcella Bovio ◀Supervisor Joop van Loon**

### Separating proteins

Ultrafiltration can be used to filter larger particles out of a liquid. Small molecules and liquids pass through a membrane while larger particles are left behind in the filter column. But it is difficult to use this method to separate particles of similar size and weight, such as multiple proteins, from one another. Eric Suryawirawan experimented with the pH and electrostatic charge of the filtration system to filter out specific proteins from mixtures of proteins. Eventually he was able to filter out α-lactalbumin with a purity of 78 per cent from whey protein isolate. RK

*Protein Transport in Open Ultrafiltration.* **Eric Suryawirawan ◀Supervisor Anja Janssen**

## THE PROPOSITION

PhD students explain their most provocative statement. This time it's Joris van Steenbrugge, who received his PhD on 13 March for his research on plant-parasitic nematode effectors.

## 'The Dutch school system would benefit from switching from numerical scores to binary assessments'

'Research shows that Dutch secondary-school children are among the least motivated schoolchildren in the world. Furthermore, one in three experiences psychological problems. There are various possible reasons for this, but the numerical grading system is certainly a factor.

On average, Dutch schoolchildren get 102 grades a year. That is almost three per week in class. It puts a lot of pressure on the children. This assessment system makes learning less fun and in my opinion society gains nothing from it. The aim of education is to give the schoolchildren certain basic knowledge. So you want to test whether someone has absorbed the knowledge and can apply it. I don't think adding numerical grades helps in achieving that. That is why I am an advocate of a binary system in which we only say whether someone passed or failed.

Advocates of the current grading system will say the possibility of getting high grades encourages excellence. That may be the case for students who are outstanding anyway, but a binary system would let average students focus on the subjects they are better at or enjoy because they won't feel pressured to get good grades for the subjects they are bad at.' DV

# Leary model

Sjoukje Osinga

As a teacher, you have to decide how to treat a group of students. Do you steer them in a certain direction with your advice, or wait until they come up with an idea, and then hold back on giving your opinion immediately? Do you help them with ideas, or do you play devil's advocate? When I was doing my basic teacher training, I got told about the Leary model to make me aware of these choices. You are always somewhere between 'above' (managing) and 'under' (following) and between 'together' (cooperating) and 'against' (attacking). Since I started exercising at the Bongerd, I understand this much better. You are unlikely to find me in the gym because three sets of 12 lifts on some apparatus is not my core competence. I tend to conclude halfway through a set that I've done enough. Or I give the last set a miss. Or a machine. Or the entire gym session. No, I much prefer a group lesson, because if there's a teacher and other participants I have to turn up.

**The teacher is quite happy to call out to me across the room: 'Sjoukje, you're not a pot-bellied pig!'**

I have seen teachers demonstrate all the Leary model categories. 'I can feel those lower back muscles now; can you guys too?' (together). 'If you find this one easy, try doing it on one leg (against). 'Does it hurt? Great! It's about to get much worse!' (above-against). Teacher Ingi knows everyone by name. When I drop too far down on my arms with my legs on a space hopper, she is quite happy to call out to me across the room: 'Sjoukje, you're not a pot-bellied pig!' She also praises you exuberantly so I'm prepared to take such comments (above-cooperating).
Sometimes a change in perspective can be effective. Ingi wasn't able to come last week and our group lesson for staff got a really young substitute teacher. He seemed to be asking permission for everything: 'Is it OK if we continue, or would you like to rest a bit longer? (under-cooperating). When I told him he should just get on with it because we're not doing this for fun, we're doing it because it is good for us, he soon changed his tune. He came and stood next to me: 'Excellent! Your muscles will ache tomorrow!' (above-against).

Sjoukje Osinga (56) is an assistant professor of Information Technology. She sings alto in the Wageningen chamber choir Musica Vocale, has three sons who are students and enjoys birdwatching with her husband in the Binnenveldse Hooilanden

Protesting farmers

# ‘THEY SHARE A WISH FOR A SECURE LIVELIHOOD’

Farmers are protesting all over Europe at the moment, from the A50 motorway in Beekbergen to Brussels, Berlin and Paris. What is going on, what have international farmers’ protests got in common with the Dutch protests, and how can the sector calm down again? Han Wiskerke, professor of Rural Sociology, explains. ‘The lack of a vision for the future is disastrous.’

Text Marieke Enter

The Netherlands has been in the grip of heated farmers’ protests for three years now, in response to the threat of a reduction in the livestock population due to the nitrogen crisis. Recently, farmers have also started protesting in countries including Germany, France, Belgium, Italy, Romania and Spain. The Rural Sociology chair group has been following the developments with particular interest: the group studies agricultural dynamics and regional rural development. That is why we are asking their chair holder Han Wiskerke to explain what is going on with the Dutch and European farmers’ protests.

**The German farmers were protesting about diesel, the French about pesticides, the Spanish about water and the Dutch about nitrogen. Is it also essentially about the same thing?**

‘The common denominator in farmers’ protests, regardless of geography or time period, is basically always the wish for a secure livelihood. Farmers take action because of that fundamental question, first of all in the present day: will I still be able to make a living with my farm? Security in the longer term can also be an issue that spurs farmers to protest: will I be able to carry on farming and will my children be able to take over the farm? Another factor, although it is less important, is the feeling of being restricted in their entrepreneurial spirit.’

**Do farmers have a point with their concerns?**

‘They have been subjected to a lot of interventions in recent years to do with the environment and nature. They have to cope with a huge amount of paperwork that sometimes verges on the bizarre, with measures where you can’t really see what purpose they serve. Take calendar farming: if farmers fail to harvest their potatoes by 1 October, they are not allowed to spread as much manure the following year. That still applies in unfavourable years such as last year, with a wet spring, dry summer and soaking wet autumn. Farmers find this incomprehensible. They feel trapped by an unreliable government.’

**Is that why the protests seem to be getting more heated?**

‘In part, although I think the fury of the current protests is mainly due to the lack of prospects. There were farmers’ protests in previous decades too, but at least then there was a shared view on where agriculture should be heading.

**‘THERE IS SO MUCH PAPERWORK, SOMETIMES VERGING ON THE BIZARRE’**

'The fury of the current protests is mainly due to the lack of prospects.' ◆ Illustration Valerie Geelen

# 'FARMERS FEEL TRAPPED BY AN UNRELIABLE GOVERNMENT'

In the 1960s and 1970s at any rate, the course in the Netherlands was clear: agriculture had to grow to provide goods for export. That was also the frame that effectively kept environmental legislation at bay, or implemented in watered-down form, for years. The ministry supported this too, because it was assumed technical solutions would be found in the end. That turned out to be a miscalculation. Which is why we now have the threat of drastic measures after all, at a time when farming incomes are under pressure and there are no clear prospects. The lack of a vision for the future is disastrous.'

**Many Dutch farmers are millionaires, on paper at any rate. Surely farming incomes are not suffering that much?**

'There are big differences. We did quite an extensive study on this topic in 2020. It turned out then that only 25 per cent of the farmers got all their income from farming. The vast majority earn a significant proportion of their income from other farm-related activities such as cafes or recreation, or even a second job. And while all respondents were dissatisfied with the revenue from agriculture, nearly all farmers with additional sources of income were satisfied with the family income. Some farmers have broadened their business activities purely for economic reasons. That is painful. This was never their intention in choosing to become a farmer.'

**You mean it undermines their identity as producers of food? Like their slogan: no farmers, no food?**

'Not like that. In my opinion, it's Big Agribusiness that has been emphasizing the identity of farmers as food producers and promoting "no farmers, no food"

## ‘THE NETHERLANDS AS AN EXPORT COUNTRY WAS THE FRAME THAT EFFECTIVELY KEPT ENVIRONMENTAL LEGISLATION AT BAY FOR YEARS’

because it’s convenient to them. I don’t hear farmers talk much about “producing food” even though I grew up in an arable farming family and as a scientist I’ve interviewed a lot of farmers. Farmers are mainly interested in their crops or animals and the expertise needed to deliver good products and get a good yield. They identify above all with an entrepreneurial spirit, being outdoors and working with nature.’

### Is the term ‘farmer’ due a revision?

‘That is already happening to some extent. People are increasingly talking about the valuable ecosystem services farmers could deliver and get paid properly for, even if such discussions often use negative terms such as “handouts” and “taxpayers’ money”. Which is unjustified, I think. You never hear that when talking about road builders say, even though it is essentially the same thing: businesses are paid to deliver a service that is of value to society as a whole. In both cases, it’s important for the government to show it is a trustworthy partner. What happened recently in Gelderland, where the provincial authority threatened to cancel a 30-year scheme for nature-inclusive agriculture after only one year, is quite unacceptable. You only need a few incidents like that and their trust has gone for good.’

### Isn’t the uncertainty lasting too long — the programme for tackling the nitrogen problem has been on the cards since May 2019? Won’t farmers find it all too much?

‘We haven’t researched this specifically. But I do think offering certainty is an important issue and there is real disregard for the mental well-being of farmers and their families. For years, farmers have had a higher suicide rate than other professions. Being responsible for a farm that has often been in the family for generations puts huge pressure on them. You don’t want to be the one to give it up. If none of the children want to take over the farm, that is a sad situation too but at least you can explain it to the outside world. That’s different if you can’t cope any more. Farmers experience that as failure, as if you have squandered the inheritance you got from your parents, grandparents and preceding generations. That is an enormous pressure and is still something people don’t talk about.’

### What do you think will happen next?

‘I find it difficult to say, in part because agricultural policy has been driven by a “dig your heels in” mindset for years. That is happening now too: the EU’s Green Deal has been watered down and the Netherlands is still dithering about its nitrogen measures. It is political opportunism that seems to offer breathing space but in fact is only postponing the inevitable. Neither the politicians nor the farming sector gain from this because it only increases the need to take drastic measures later on. There is absolutely no clear vision on what course to take. That applies to the agricultural sector too, where it seems the loudest voices get listened to most, at the expense of the silent majority. In that regard, I was pleased to see serious talks with organizations such as Caring Farmers and Farmers of the Future, and their Green Farming plan, in the lead-up to the Agricultural Agreement. These are groups who do have a vision and who realize things need to change.’ ■

# ‘We want to understand microbes better’

**The aim is to get a better understanding of microbes, and how they interact with each other and the environment. To achieve this, the Wageningen Microbiome Centre (WMC) is being set up, says Hauke Smidt, personal professor in Microbiology and one of the people behind the new centre.**

There it was all of a sudden, two weeks ago: a plan for a brand-new initiative, including new building. But it was not as sudden as it looked, explains Smidt. ‘The idea started five years ago, when fellow initiator Thijs Ettema was appointed to the chair of Microbiology. Many different groups do microbiological research in Wageningen, both research groups at WUR and scientists at the Netherlands Institute of Ecology (NIOO-KNAW). The plan was to do something about that fragmentation and bring the researchers closer together.’

## Do you need a new building for that?

‘Collaborating in a virtual centre is not so effective. There is also a shortage of space and we saw unique possibilities from creating a bricks-and-mortar centre.’

## How big will the WMC be?

‘It will house various research groups from WUR, NIOO-KNAW and UNLOCK. UNLOCK is what is termed an infrastructure for studying microbial communities, which received funding in 2020 from the Dutch Research Council, WUR and Delft University of Technology. The new research building will house five chair groups in their entirety, two of the four UNLOCK sections and the Bioconversion group. In total, that is several hundred people. The Microbiology chair group alone has about 120 staff and thesis students. The other chair groups are Toxicology, Host-Microbe Interactomics, Bioprocess Engineering and Systems & Synthetic Biology. The building will be constructed on what is now the car park next to Axis.’

## What is the added value of the new centre?

‘Microbiomes play a big role in domains such as the circular economy and circular agriculture, and when dealing with the consequences of climate change. There is also immense potential in microorganisms that cannot as yet be cultivated. If you want to use microbiomes to improve human and animal health, crop yields and the sustainability of processes, you have to understand how such microbial communities function. That requires above all fundamental knowledge of a kind that is largely lacking at the moment. We want to understand the systems better and develop feasible rules for managing them. The assumption is that the basic principles governing how microorganisms cooperate and communicate and/or compete with one another are universal.’

Artist’s impression of the new building

## What are the next steps?

‘A think tank that involves all the participants in the WMC is now working on determining the lines of research. This is partly with a view to a possible future investment theme in WUR’s strategic plan. We are also working hard on the plans for the new research building. The Executive Board has given its approval and we already have a design. We are now in the property development phase. The plans are becoming more concrete. We also need to make sure the microbiologists who won’t be moving to the new building still remain involved in the developments.’ RK


# MICROALGAE FARM 2.0

**More tubes carrying flows of algae, new systems for faster selection of algae strains and new equipment for purifying bioproducts from algae: the capacity of the campus microalgae farm AlgaePARC has almost doubled. The official opening of the new facilities took place on 5 March. There is a marked difference compared with the application of microalgae ten years ago: the focus then was on biofuels, now more on food. 'We make our technology available to start-ups and other small companies so they can test their ideas without having to make major investments,' said Maria Barbosa, director of AlgaePARC and professor of Bioprocess Engineering, in an interview on the intranet.** WA

Photo Guy Ackermans

Ellen Kampman studies the role of lifestyle in cancer

# ‘I speak out against harmful dietary advice’

Professor of Nutrition & Disease Ellen Kampman has been investigating the role of lifestyle and diet in cancer for 35 years. The results are now starting to come in from a large cohort study she set up 15 years ago. ‘My sister-in-law got cancer and asked me what I could advise people who already had cancer. There was no answer to that then, and that set me thinking.’ Text Dominique Vrouwenvelder ◆ Photos Duncan de Fey

‘In mid-February, we published the latest findings from the COLON cohort study showing that coffee has a favourable effect on survival after bowel cancer. The media come to me then. The PhD candidate who did this project doesn’t speak Dutch and therefore couldn’t talk to the press, so I’m the one who ends up in the news. Otherwise I would have let her handle it. I find that appropriate now I am nearing the end of my career. ‘I still have five years to go before my retirement, but I am already taking a step back. My name is no longer on project proposals unless I wrote them myself. And I’m usually no longer the last, most senior author in papers; sometimes I’m not listed as an author at all. Too often, I see people who want to hold onto their research. I understand why, but I think we should make way for younger researchers. Gradually winding down is a choice I made rationally, but it feels right to me emotionally.

‘I THINK WE SHOULD MAKE WAY FOR YOUNGER RESEARCHERS’

‘I got a statuette, a mentor award, from Fränzel van Duijnhoven, Dieuwertje Kok and Renate Winkels, three women in the Nutrition and Disease chair group, each of whom has developed their own line of research, in part using the COLON cohort. The figurine shows a woman holding up three other women. They found that a good representation of our relationship. Although I don’t see it quite that simply: they hold me up too. I should try and find a figurine with the reverse image. ‘Meanwhile, I can start looking forward to the things I’ll do when I’m retired. I love plants so I will be doing a lot of gardening, for example in the garden of Toon Hermans Huis in Ede. I helped start this special garden for cancer patients and I like going there.’

## Bad luck

‘I actually came to Wageningen to study Plant Breeding but it turned out different to what I expected — it wasn’t about growing plants in a greenhouse. A flatmate was studying Nutrition and Health and she had really fun practicals. By Christmas, I had switched degree subject. The professor who supervised my final internship sent me to Greece to do research on gastric cancer. I fell in love with this topic immediately. I have

been studying cancer now for some 35 years.
'Back then, researchers thought it was pure bad luck if you got the disease, or perhaps something genetic. According to them, it had nothing to do with lifestyle. I didn't believe that one little bit. I spent the first 25 years of my career mainly doing research on the lifestyle of healthy people, with the aim of preventing cancer. Lifestyle has most effect on bowel cancer, so we decided to study that variant. I think we now largely know how lifestyle affects the risk of healthy people getting bowel cancer. Recommendations to reduce the risk of cancer have been drawn up based on all the research in the Netherlands and elsewhere, including our own research.
'But people who already had cancer were also increasingly asking what they could do — before, during and after treatment — to improve their chances of survival. Around that time, my sister-in-law got breast cancer. She asked me straight up, "Ellen, what can you tell people in my situation?" I had no answer to that, as there wasn't much known scientifically that could be of use to this group — people who were already patients. That set me thinking. It was why I started looking into the role of lifestyle in cancer patients; we have been doing that for 15 years now.'

## Millions

'Around 2010, a couple of developments coincided. I became a professor at WUR and the World Cancer

'RESEARCHERS THOUGHT BACK THEN THAT YOU GOT CANCER DUE TO BAD LUCK OR SOMETHING GENETIC'

'The study has already been very fruitful: 10 researchers got their PhDs working on it and a lot of postdocs have used the data. And we have published at least 60 papers on this study.'

Research Fund wanted to collaborate with us on a new study on lifestyle in connection with cancer treatments. We used the money the Fund gave us to start up the COLON study for lifestyle research in bowel cancer patients. You need an awful lot of money for cohort studies — studies where you follow a group of people with a particular disease over decades. That cohort has cost a few million by now.

'Since 2010, we have been collecting lifestyle data on bowel cancer patients for this study. Our data collection starts soon after the patients get their diagnosis. We ask them, via the doctor treating them, whether they want to join our observational study. We get them to fill in questionnaires on their lifestyle habits, we take blood samples and we ask them to collect faeces samples. We repeat this after six months and one, two and five years. With their consent, we link the data to the cancer registry, among other things. Then we know whether our participants get cancer again or die.'

## Long haul

'We stopped taking on new participants a couple of years ago. Our cohort now has data on about 2100 people with bowel cancer, from 11 hospitals. We will continue to follow those people to see how they do. We have been following some of them for nearly 15 years now and the cohort is starting to bear fruit.

'You are in it for the long haul with research like this. Survival rates with bowel cancer are — fortunately — quite high so patients can stay in the study for a long time. What is more, you can't assess the influence of lifestyle on someone's health with just one measurement. But the study has already been very fruitful: 10 researchers got their PhDs working on it and a lot of postdocs have used the data. We have published at least 60 papers on the study.

'A cohort like this keeps going for years and it's a shame if you use it to only answer one research question. That is why we ask the patients so many questions: from what vitamins and supplements they use to physical exercise, smoking and sleeping. Looking back, I would like to have measured stress levels too, but we didn't have good methods for that at the time. In fact, they are still in development. Patients are curious about the link between stress and cancer.'

'OUR COHORT HAS DATA ON ABOUT 2100 PEOPLE WITH BOWEL CANCER'

## Coffee

'So patients and their healthcare providers steer our research to some extent. When they ask questions, that can prompt us to write new project proposals. Coffee was one such question. Patients face so many restrictions that they were hoping they could still drink coffee.

'We store the samples from our study in the freezer and the data on a hard drive. If we have new research questions, we retrieve the data we need and analyse it. We can also relate that data to other cohorts in the Netherlands and abroad. That is because they use the same questionnaires so we can compare our data or merge it with theirs.

# ‘THE NETHERLANDS HAS 17 MILLION NUTRITIONAL SCIENTISTS’

‘Sometimes we have a research question that is specific to a small group of people, for example for patients with rectal cancer. This group has a different chance of survival and different symptoms to patients who get cancer at the other end of their intestines, and they get a different kind of treatment. If we can merge data from various cohorts on these patients, we have more information to go on and we can find new associations.’

## Chicken or egg

‘The disadvantage of observational research is the chicken or egg dilemma: you can never be sure about causality. In our analyses, we correct for factors that are interrelated. For example, vegans are often very health-conscious. Are they healthier despite their vegan diet or because of it?

‘So we need to think hard in advance about how all the health factors are interlinked before we do any analyses. And we have to compare our results with other studies that looked at the same things. Sometimes experimental studies are carried out with human subjects, but you can’t use that approach for everything. For example, it is unethical to force alcohol down people and see what that does to their health. Or to wait until people get cancer without treating them and then decide afterwards what the culprits were.’

‘People sometimes ask me whether what we do here is proper Wageningen research. WUR seems essentially to still be an agricultural university; I rarely read much about human nutrition and health in the strategic plan, for instance.

‘And yet the Human Nutrition and Health department has existed for over 50 years. We have been studying the relationship between nutrition and disease for half a century. What is more, virtually everyone who has anything to say scientifically on nutrition in the Netherlands did the Bachelor’s and Master’s in Nutrition and Health at Wageningen. That says something about the quality of our work and degree programme. The nice thing about Wageningen in my opinion is that in addition to health, we also take sustainability into account in our research. What is more, we have access to expertise on such topics as food chemistry, biology, cell biology and human and animal physiology.

‘WUR has changed over the past 40 years. It has become more diverse, with less of a male-dominated culture. It is good that we have a woman on the Executive Board and that the new rector will be a woman. It’s good for women to be seen to be occupying senior management positions. I find diversity increasing in more and more places, and I’m delighted with that.’

‘The Netherlands has 17 million nutritional scientists. But we are different because we can justify our statements with sound scientific evidence. Sometimes, especially on social media, claims are made where I think: how on earth did they come up with that? Recently, someone wanted to know whether green bananas in particular protect against cancer. I can laugh about that one, but when people give advice that can be harmful, I always intervene. For example, if they say alcohol or a diet with a lot of meat is good for you, I speak out. I won’t allow nonsense.’ ■

**CV**

### Prof. Ellen Kampman

**1981-1988**
Degree in Nutrition and Health, Wageningen
**1989-1994**
PhD candidate at Maastricht University
**1991**
Visiting research fellow at the Harvard School of Public Health, Boston, (Massachusetts), USA
**1994-1996**
Postdoc at the Fred Hutchinson Cancer Research Centre, Seattle, (Washington), USA
**1996-present**
Wageningen University & Research
**2008**
Appointed personal professor of Nutrition and Cancer
**2015**
Appointed to the chair of Nutrition and Disease

Ellen Kampman is a member of various Dutch and international committees, including the supervisory board of the Netherlands Nutrition Centre and the Public Health consultation group of the Health Council of the Netherlands.

Higher education jointly looks for answers:

# HOW CAN AI BE USED IN EDUCATION?

Artificial intelligence (AI) is here to stay in education. Teachers and students use AI to create tests and complete assignments. But how can the technology be used in a way that supports learning, is constructive and leaves room for human values? In short, how should we deal with AI in higher education?

Text Luuk Zegers

This question was at the heart of this year's edition of the annual ICAB conference. In this conference for innovation centres in academic science education, held at the start of March in Omnia, 165 people from higher education institutions gathered together to look for answers and share their expertise. 'Don't teach general AI skills as a separate module. That will only bore students.'

'What do you want to write today?' asks Jenni. 'I have to do a literature study on materials for transparent electrodes,' says Andy. 'Good assignment,' says Jenni and she starts writing. After a few sentences have appeared on the screen, she asks: 'What do you think of this?' After she gets the OK, Jenni continues writing and in no time she has produced a complete literature review.

Jenni is not a person; 'she' is an AI tool developed specifically to generate academic texts. And it works, says YouTuber Andy Stapleton, an academic who tries out AI tools, in his video. 'It keeps on building up the literature review without you even having to think about it! Of course I need to check it, but I don't think it could be any easier.'

The video described above serves as the start of the talk given by Laura Koenders, education consultant at Utrecht University. Her talk is about the impact of generative AI tools (tools that can generate their own content) on testing. 'This is the level of AI capability our students can use now,' she says. That raises questions among the attendees. Because if students can already let AI do most of the work for writing assignments such as essays and literature studies, what is the point of such assignments? How do you know what the students did themselves and what they used AI to generate? How can you set up your teaching and testing in such a way that AI is used as an aid but is not misused? And how do you avoid a situation where rich students get better grades because they can access the premium versions of such tools, which tend to be better?

## Redesign

Koenders helps teachers redesign courses and degree programmes. 'In the past year, nearly all questions were about ChatGPT,' she says. 'If you are here to get

**'If you tackle AI in a separate course and in abstract terms, students will get bored'**


An image generated by Dall-E during the conference. The AI image generator was instructed to create a 'graphical summary' of a session about the board game *Best of Both Worlds*. In that game, educational professionals explore the synergy between humans and generative AI.

some concrete answers, you are going to be disappointed because I don't have them yet.'

She is able to share some insights, though. 'If you want students to learn how to write academic texts, test that in a controlled environment, for example with a writing assignment they complete in the classroom. If the emphasis is on critical reflection, you can have an oral exam instead of a written assessment. And if you actually want students to use AI tools for a written assignment, set clear rules. And make them reflect on the use of the tool. Ask students what prompts (the instructions or hints you give the AI tool, ed.) they used for ChatGPT and how they think using the tool made their essay better.'

Teachers also need to ask themselves questions if they want to use AI effectively in their teaching, says Koenders: 'What is the learning objective? Analysing the literature? Learning to reflect critically? Writing? And is being able to write well a skill we will still find valuable in 10 years' time?'

Sjoerd van Gurp, a teacher and education developer at Avans University of Applied Sciences, argues that higher education cannot ignore the use of artificial intelligence. He encourages teachers to reflect systematically on its use in education. 'It starts with assessing the impact of the technology: what are the positive and negative effects on teaching? In the case of positive effects: support its use and see what students need to be able to benefit from AI. In the case of negative effects: adapt the learning activity so as to minimize those negative effects.' You could offer completely different learning activities, for example. Another option is to discuss the negative effects with the students beforehand so they understand why you should not use AI for absolutely everything.

## AI skills

Another recurring question at the conference is what skills students should learn now for their jobs in the future. It is clear AI literacy is one such skill. But how can you teach that? In his keynote speech, WUR professor Ioannis Athanasiadis (AI and Data Science) advocates designing lessons in AI skills that are geared to the specific degree subject.

'AI can help resolve complex problems such as detecting skin cancer or solving difficult maths questions. But you won't get those solutions just by being skilled in the application of AI; you need to combine that with knowledge of the field.' In teaching too, that combination needs to be the focus, says Athanasiadis. There will soon come a time when you won't get far if you are an expert in the field but don't have AI skills, or if you have AI

### Three tools to play with

There are a lot of generative AI tools that can help students, teachers and researchers. Here are three tools you can try out.

**Elicit:** good tool for searching for specific data in scientific articles and then automatically summarizing the information.

**Jenni:** can take over the academic writing work to a large extent, including citations.

**ChatGPT:** can summarize texts, generate practice exam questions, restructure sentences, translate, explain complex concepts and help with brainstorming.

skills but lack the specific expertise. ‘It is all about the combination, and that is our added value as a university.’
Willem-Paul Brinkman, associate professor in Interactive Intelligence and programme director for Computer Science at Delft University of Technology, continues on this theme with his talk on *AI-ready Curricula*. ‘Students choose to study a particular subject. If you deal with artificial intelligence in a separate course and in abstract terms, the students will get bored. They didn’t come to your university to attend lectures on AI.’ So start by teaching the basics of that degree subject, for example entomology, and then use practical examples from that field in your AI teaching. This means AI education needs to be more than an elective minor or a compulsory course on AI skills that is separate from the degree subject. Brinkman sees AI education as something that should be incorporated in various courses at all stages of the curriculum and that should be taught by staff who are experts in the degree subject. So the course ‘AI for entomologists’ would be taught by an entomologist, not by an AI expert. ‘But if you are going to do this, you need to figure out how you are going to set it up in the curriculum.’
To incorporate subject-specific AI skills in the curriculum, Brinkman has formulated five principles (see inset). He ends with a warning. ‘Don’t jump in at the deep end with AI: if you let generative AI take over too much of the subject-specific knowledge, you won’t have any experts in that field left.’

## Calculator

Brinkman is not the only one to mention this risk during the conference. ‘Basic skills are important,’ says Cynthia Liem, associate professor in Artificial Intelligence at Delft, in her keynote speech. ‘We teach children to do sums before we give them a calculator.’ She calls for renewed appreciation of the inherent value in struggling to get good at something. Liem herself trained as a concert pianist. ‘It sometimes seems as if only the worlds of music and sport still have that painful learning process. In other areas, we increasingly opt for convenience, for example by letting AI do all the hard work. But at what expense? Do we still understand what we are doing when we let a tool do everything?
She points to the video game industry. ‘A lot of people in junior positions are getting laid off now because they do work that can easily be replaced by AI tools. But the experts in the industry had to go through a tough learning process themselves to get good at what they do. They invested time and effort in learning their trade. Who is going to do that now? If we only look at what AI tools can do in the short term and not at what they will cost us in the long term, we will end up without any experts.’

**‘Who is still going to invest time and effort in learning a trade?’**

## Figuring it out

The attendees at the conference discuss many other possibilities of generative AI (such as using tools to help compile practice exam questions and check tests) and risks (privacy and copyright issues, whether AI detection software is needed or even possible, or the energy consumption of AI tools like ChatGPT). What is clear at any rate is that AI is going full steam ahead. It is a reality higher education will have to deal with. Or as Arthur Mol (still rector at the time of the conference) said in his welcome speech: ‘We are seeing a mere glimpse of what AI is capable of, how we can use it and what we should definitely not use it for. What role do we want to give AI in our education and research? We will be figuring that out for a long while yet.’ ■

**Five principles for teaching AI in a specific degree subject**

1. AI should strengthen the students’ skills and knowledge about the subject, not weaken them. So teach the basics of the subject BEFORE you teach subject-related AI.
2. Students need to understand how artificial intelligence works and what it can and can’t do before you teach them subject-related AI.
3. Subject experts should give the subject-related AI courses, not AI experts.
4. Students also need general AI skills such as fact checking and how to design prompts (hints and instructions for the AI tool).
5. Make AI education cohesive. Create a curriculum path.

These tips come from Willem-Paul Brinkman, associate professor in Interactive Intelligence and programme director for Computer Science at Delft University of Technology.

# Viewpoint: Return of the mammoth? 'I fear backlash against CRISPR technology'

The woolly mammoth will be making a comeback in 2028, Colossal Biosciences announced last month on Instagram. The American company wants to bring the extinct species back to life using gene technology. Biotechnologist and CRISPR John van der Oost (Microbiology) comments on the news.

If Colossal Biosciences has its way, in four years' time the first woolly mammoth for 4,000 years will be born. The company of Harvard geneticist George Church wants to bring back the extinct species by inserting pieces of mammoth DNA in the genome of the Asian elephant. Wageningen microbiologist John van der Oost has been using the CRISPR-Cas technique since 2005 and he has mixed feelings about the mammoth project.

Photo Shutterstock

## A mammoth calf in 2028 — is that realistic?

'I can't really say. George Church has managed a lot of challenging achievements. Six months after the discovery of CRISPR-Cas9, his group was one of the first to use the technique to modify human DNA. Even if it takes him until 2030, it would still be a tour de force.'

## Colossal uses multiplex genome editing to put mammoth genes in the elephant genome. How does that work?

'Multiplex editing means CRISPR-Cas makes cuts at multiple points in the DNA simultaneously. So-called RNA guide molecules make sure the Cas protein — the scissors — recognizes the point where the cut has to be made. If you add 10 RNA guides, you can make the cut at 10 different points. Then you insert the mammoth genes at those points. That lets you modify multiple genes in the same genome. In 2017, our group worked with a group in Boston to modify the DNA of mice using the Cas12 protein. We changed three genes in the mice cells.'

**'I am interested to see whether they can manage it, but personally I'm against it'**

## The company says it has already found over 50 genes for mammoth characteristics such as long hair, more fat and their rounded skull. Can you predict like this which genes code for which characteristics?

'No. You actually have to control everything. It is not a given they will manage this. For some characteristics, the proteins produced by the genes have to cooperate with one another. Everything has to match together precisely. If you still have proteins that are 100 per cent elephant, it might not work so well. But who knows, maybe they'll get lucky and have a healthy mammoth walking around in five years' time.'

## Would you like that?

'I think it's a step too far. The question is whether we want to be doing this. I find it interesting to see whether they can manage it, but personally I'm against it. It's basically a designer elephant. If we don't find it ethically responsible to make designer babies, then I don't find this a good idea either.

I am also afraid experiments like this will divide people and have a polarizing effect. That can lead to a backlash against all the wonderful things we can do with CRISPR to make the world a better place. Take gene therapy for hereditary diseases such as sickle cell anaemia, or improving crops to increase food security. That too can be an argument to call it a day for the mammoth.' ■ SS

Book honours Gerrit Grijns

# The tragedy of a vitamin pioneer

Wageningen professor Gerrit Grijns (1865-1944) discovered the vitamins, but did not get a Nobel Prize for this. While others did. A great injustice, according to science historian Rob van den Berg in his book *De Vitaminepioniers* (the vitamin pioneers).

Text Roelof Kleis

Rob van den Berg has to admit that until a few years ago he had never heard of Gerrit Grijns. It was his supervisor Frans van Lunteren, professor of the History of the Natural Sciences in Leiden, who drew his attention to the story. 'In 1929, Christiaan Eijkman got the Nobel Prize for the discovery of vitamin B1. But he didn't actually believe in the existence of vitamins. The vitamin theory came from his assistant Gerrit Grijns. You should look into this, said Frans.'

Over the past two years, Van den Berg has delved into that history. His book on the vitamin pioneers is his account of that quest and it reads like a detective story. It was one surprise after another for Van den Berg. 'The situation was even more extreme than was thought. For nearly 30 years, Eijkman openly opposed Grijns's vitamin theory. All that time, he ridiculed Grijns's ideas and tried to sweep them under the carpet. He only changed his mind when vitamin B1 was isolated in 1926. And then it was Eijkman who got the Nobel Prize.'

Eijkman was awarded the Nobel Prize for his discovery in 1890 in the Dutch East Indies that chickens with beriberi recovered if they were fed unpolished rice instead of polished rice. That observation saved the lives of thousands of people. The dreaded disease of beriberi could be prevented and even cured with the right diet. After first proposing all kinds of alternative explanations, Eijkman decided the disease must be caused by a toxin that formed from starch in the chickens' crop. His successor Grijns showed this was not the case. In a series of ingenious animal experiments, he also disproved all the other explanations that had been proposed. Then he came up with the ground-breaking idea that beriberi was a disease caused by a lack of something. Humans and animals die on a diet of white rice due to a lack of some unknown substance in the husk of brown rice.

**Nobel Prize winner Eijkman spent years openly attacking Grijns's vitamin theory**

## Bad luck

Grijns's insight, which he published in 1901 in a Dutch East Indies medical journal, was quite revolutionary. 'The accepted doctrine was that carbohydrates, fats, proteins and minerals were all humans and animals needed,' explains Van den Berg. 'Grijns showed that was not the case. It's an amazing insight, entirely attributable to him.'

The new category of substances was

Gerrit Grijns in his office as director of the Medical Laboratory in Batavia (now Jakarta) • Photo Museum Boerhave

later called vitamins. Incidentally, Grijns was never able to isolate the vitamin he theorized about, the vitamin B1 associated with beriberi. Two Dutch doctors did manage this eventually in 1926. By that time, the concept of vitamins was already widely accepted.

But why did Eijkman get the Nobel Prize for discovering this vitamin and not Grijns? 'Pure bad luck' is Van den Berg's conclusion after studying a large number of documents, including the deliberations of the Nobel Committee. From 1914 onwards, the research on vitamins had been considered for a Nobel Prize on various occasions. Eijkman, whether or not in combination with Grijns and others, was nominated several times. 'But they thought Eijkman's work was too long ago to qualify for a prize. And he had contributed too little to the research. Then they decided in 1929 to give it to him anyway. Vitamin B1 had been isolated three years earlier, so that meant there was definite proof for the existence of vitamins. And that put Eijkman back in the picture. He was nominated along with three others by the British chemist George Barger. Gerrit Grijns was not among the four.'

## Empty handed

Barger might not have been aware of Grijns's work as he mainly published in Dutch. 'It is possible, but we don't know for sure,' says Van den Berg. 'Interestingly, the Nobel Committee did seem to know Grijns's work. The deliberation concerning the nomination states explicitly that Grijns was the first to come up with the idea that a healthy diet requires more than just fats, proteins, carbohydrates and minerals. That raises the question whether you should award the prize if you know it means you are overlooking someone else. On the other hand, the Nobel Committee is not allowed to nominate anyone; they have to work with the nominations they get.' Eijkman got the prize for the discovery of the vitamin, the substance he spent almost his whole life denying the existence of. Grijns was left empty handed. In his speech accepting the prize, Eijkman did not even mention Grijns's contribution. 'Eijkman behaved badly towards Grijns,' says Van den Berg bluntly. That explains the subtitle of Van den Berg's book: *How two Dutch doctors discovered vitamins and only one got the Nobel Prize for it.* That sounds rather critical and indignant. Correct, admits Van den Berg. You can see the book as an attempt at a rehabilitation. A lot went wrong with the award of this Nobel Prize, and Gerrit Grijns lost out as a result. ■


***De Vitaminepioniers***
Author Rob van den Berg
Publisher Prometheus
25.99 euros

# Irregular Opening Hours April & May 2024

## Forum

| | | Building | Library | Student Service Centre | ServicePoint IT | Restaurant | Grand Café | Wageningen in'to Languages |
|---|---|---|---|---|---|---|---|---|
| **Good Friday** | **29 March** | 8 am - 11 pm | 8 am - 10 pm | closed | closed | closed | closed | closed |
| **Saturday** | **30 March** | 10 am - 6 pm | 10 am - 6 pm | closed | closed | closed | closed | closed |
| **Easter Sunday** | **31 March** | closed | closed | closed | closed | closed | closed | closed |
| **Easter Monday** | **1 April** | 10 am - 6 pm | 10 am - 6 pm | closed | closed | closed | closed | closed |
| **Saturday** | **20 April** | 9 am - 7 pm | 9 am - 7 pm | closed | closed | closed | 11 am - 4 pm | closed |
| **Sunday** | **21 April** | 9 am - 7 pm | 9 am - 7 pm | closed | closed | closed | closed | closed |
| **Monday** | **22 April** | 8 am - 11 pm | 8 am - 11 pm | 10 am - 2:30 pm | 8:30 am - 5 pm | 11 am - 2 pm | 8 am - 5 pm | 10 am - 2 pm |
| **Tuesday** | **23 April** | 8 am - 11 pm | 8 am - 11 pm | 10 am - 2:30 pm | 8:30 am - 5 pm | 11 am - 2 pm | 8 am - 5 pm | 10 am - 2 pm |
| **Wednesday** | **24 April** | 8 am - 11 pm | 8 am - 11 pm | 10 am - 2:30 pm | 8:30 am - 5 pm | 11 am - 2 pm | 8 am - 5 pm | 10 am - 2 pm |
| **Thursday** | **25 April** | 8 am - 11 pm | 8 am - 11 pm | 10 am - 2:30 pm | 8:30 am - 5 pm | 11 am - 2 pm | 8 am - 5 pm | 10 am - 2 pm |
| **Friday** | **26 April** | 8 am - 11 pm | 8 am - 10 pm | 10 am - 2:30 pm | 8:30 am - 5 pm | 11 am - 2 pm | 8 am - 5 pm | closed |
| **Saturday King's Day** | **27 April** | 9 am - 7 pm | 9 am - 7 pm | closed | closed | closed | closed | closed |
| **Sunday** | **28 April** | 9 am - 7 pm | 9 am - 7 pm | closed | closed | closed | closed | closed |
| **Monday** | **29 April** | 8 am - 11 pm | 8 am - 11 pm | 10 am - 2:30 pm | 8:30 am - 5 pm | 11 am - 2 pm | 8 am - 5 pm | 10 am - 2 pm |
| **Tuesday** | **30 April** | 8 am - 11 pm | 8 am - 11 pm | 10 am - 2:30 pm | 8:30 am - 5 pm | 11 am - 2 pm | 8 am - 5 pm | 10 am - 2 pm |
| **Wednesday** | **1 May** | 8 am - 11 pm | 8 am - 11 pm | 10 am - 2:30 pm | 8:30 am - 5 pm | 11 am - 2 pm | 8 am - 5 pm | 10 am - 2 pm |
| **Thursday** | **2 May** | 8 am - 11 pm | 8 am - 11 pm | 10 am - 2:30 pm | 8:30 am - 5 pm | 11 am - 2 pm | 8 am - 5 pm | 10 am - 2 pm |
| **Friday** | **3 May** | 8 am - 11 pm | 8 am - 10 pm | 10 am - 2:30 pm | 8:30 am - 5 pm | 11 am - 2 pm | 8 am - 5 pm | closed |
| **Saturday** | **4 May** | 9 am - 7 pm | 9 am - 7 pm | closed | closed | closed | 11 am - 4 pm | closed |
| **Sunday Liberation Day** | **5 May** | 9 am - 7 pm | 9 am - 7 pm | closed | closed | closed | closed | closed |

## Orion

| | | Building | Bike basement | The Spot | Restaurant |
|---|---|---|---|---|---|
| **Good Friday** | **29 March** | closed | closed | closed | closed |
| **Saturday** | **30 March** | closed | closed | closed | closed |
| **Easter Sunday** | **31 March** | closed | closed | closed | closed |
| **Easter Monday** | **1 April** | closed | closed | closed | closed |
| **Saturday King's Day** | **27 April** | closed | closed | closed | closed |
| **Sunday Liberation Day** | **5 May** | closed | closed | closed | closed |

## Aurora

| | | Building | Bike basement | Coffee Corner | Restaurant |
|---|---|---|---|---|---|
| **Good Friday** | **29 March** | closed | closed | closed | closed |
| **Saturday** | **30 March** | closed | closed | closed | closed |
| **Easter Sunday** | **31 March** | closed | closed | closed | closed |
| **Easter Monday** | **1 April** | closed | closed | closed | closed |
| **Saturday King's Day** | **27 April** | closed | closed | closed | closed |
| **Sunday Liberation Day** | **5 May** | closed | closed | closed | closed |

## Leeuwenborch

| | | Building | Library | Coffee Bar | Restaurant |
|---|---|---|---|---|---|
| **Good Friday** | **29 March** | 7 am - 6 pm | 8:30 am - 6 pm | 8:00 am - 3 pm | 11:30 am - 2 pm |
| **Saturday** | **30 March** | closed | closed | closed | closed |
| **Easter Sunday** | **31 March** | closed | closed | closed | closed |
| **Easter Monday** | **1 April** | closed | closed | closed | closed |
| **Saturday King's Day** | **27 April** | closed | closed | closed | closed |
| **Sunday** | **28 April** | closed | closed | closed | closed |
| **Monday** | **29 April** | 7 am - 8:30 pm | 8:30 am - 6 pm | 8:00 am - 3 pm | 11:30 am - 2 pm |
| **Tuesday** | **30 April** | 7 am - 8:30 pm | 8:30 am - 6 pm | 8:00 am - 3 pm | 11:30 am - 2 pm |
| **Wednesday** | **1 May** | 7 am - 8:30 pm | 8:30 am - 6 pm | 8:00 am - 3 pm | 11:30 am - 2 pm |
| **Thursday** | **2 May** | 7 am - 8:30 pm | 8:30 am - 6 pm | 8:00 am - 3 pm | 11:30 am - 2 pm |
| **Friday** | **3 May** | 7 am - 8:30 pm | 8:30 am - 6 pm | 8:00 am - 3 pm | 11:30 am - 2 pm |
| **Saturday** | **4 May** | closed | closed | closed | closed |
| **Sunday Liberation Day** | **5 May** | closed | closed | closed | closed |



WAGENINGEN
UNIVERSITY & RESEARCH

**Strong flavours from all over the world can be found in Wageningen. Xander Berkouwer (26), from the Netherlands, is chair of powerlifting club Wageningen Beasts. He shares a recipe for energy-rich banana bread.**

Flavours of WUR

**Xander Berkouwer (26)**
student

# Banana bread for Beasts!

'My mum always used to bake banana bread whenever I needed to perform, for example in competitions or for my studies during exam week. When I went to university, I continued this tradition by baking banana bread every time there was an exam week. And now I bake it for the whole team if we have a rowing competition. It makes sure we always have enough energy to perform well.'

1. Heat the oven to 180°C.
2. Mix the soft butter and sugar to form a creamy mixture.
3. Add the vanilla essence.
4. Add the eggs one by one and mix thoroughly.
5. Add the self-raising flour a little at a time. Tip: use a sieve for this.
6. Add a dash of milk if the dough is too stiff, but not too much because the bananas will make the dough softer.
7. Cut 2 to 4 bananas into cubes and mix them in with the dough.
8. Cut 1 banana into small pieces and mix it in with the dough.
9. Pour the dough into a baking tin, cut the last banana into small pieces and sprinkle them on top.
10. Put the mixture in the oven to bake for about 60 minutes.

**Ingredients (for 6 people):**

- 250g soft butter
- 200g sugar
- 6 eggs
- 500g self-raising flour
- 4 to 6 bananas (depending on the size)
- 8g vanilla essence
- 2g salt
- A little milk

Which dish reminds you of home? Share it with *Resource* so we can all enjoy it! resource@wur.nl

# Limelight

**Not much culture in Wageningen? Not true! This time, *Resource* puts Wageningen's writers, poets and brewers in the limelight.**

Text Ilja Bouwknegt

**FRI**
**22-03-2024**

***20:00 to 22:00***
Café Rad van Wageningen
1e Kloostersteeg 5
**Tickets 15 euros**

## Beer and Books

Sampling beers while Wageningen authors read from their own work – that is Beer and Books. Bblthk manager Bastian de Pooter: 'Beer and Books is an opportunity to sample beer and literature. The authors are local and so is the beer.' The event is organized in partnership with brewery Stadsbrouwerij Wageningen and is held in café Rad van Wageningen, next door to the brewery. The bblthk finds the authors by placing ads, through word of mouth and through the city poet selection process. 'Two poets who competed for the city poet position last January are taking part in this Beer and Books,' says De Pooter. 'We like giving the stage to talented people who have yet to make their name.'

People who attend the event will get five different beers. There is a writer associated with each beer. Before guests are allowed to start sipping, Dennis Lebbing of Stadsbrouwerij will tell them about the beer. Then they can get drinking, and a local writer will take the stage. 'The writers are told a few weeks in advance what "their" beer is so they can decide what they will be saying,' says De Pooter. 'The stories can be about anything, on condition they start with the beer. For example, we had someone who was assigned a honey beer and they talked about love on summers' evenings. Some might have a very technical account about labels while others talk about why beer is good for the environment. The latter very much tongue in cheek, of course.'

**'The stories can be about anything, on condition they start with the beer'**

The literary beer evenings attract a diverse public, both older people and youngsters who have just turned 18. 'Students can be harder to reach,' says De Pooter, although he wants them to come along. 'And the price is very reasonable: 15 euros for five specialty beers plus a literary experience. You won't find that anywhere else.'

Dennis Lebbing of Stadsbrouwerij ◆ Own photo

**TIPS**

**SUN 17 March**
**Sound of Science (WUR's big band)**
Café Loburg
**From 15:00 | Tickets 7.50 euros**

## Colophon


*Resource* is the independent medium for students and staff at Wageningen University & Research. *Resource* reports and interprets the news and gives the context. New articles are posted daily on resource-online.nl. The magazine is published every fortnight on Thursday.

**Contact** Questions and comments for the editors: resource@wur.nl | www.resource-online.nl

**Editorial staff** Willem Andrée (editor-in-chief), Helene Seevinck (managing editor), Roelof Kleis (editor), Luuk Zegers (editor), Marieke Enter (editor), Coretta Jongeling (online coordinator), Dominique Vrouwenvelder (editor), Thea Kuijpers (secretariat).

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Former WUR logo as an artWURk outside the FoWURm ◆ Photo Resource

# ‘WURturing Minds, WURking on the Future’

To celebrate this year’s *Dies Natalis*, WURd artist Harry Melich – the man behind all the WUR combinations — penned an ode to the university. *Resource* has decided to publish the homage in its entirety as a gift to the university on its anniversary.

‘Nestled in the scenic landscape of the Netherlands, Wageningen University and Research (WUR) stands as a beacon of academic excellence, shaping the WURldview of its diverse WURkforce and students.

At Wageningen, hardWURking individuals from around the WURld converge to tackle some of the toughest challenges facing society. From increasing biodiWURsity to feeding the growing WURld population, the university's WURkforce is dedicated to finding ansWURs to the WURld's most pressing problems.

Yet amidst the noble WURsuit of knowledge, WURries occasionally WURrface. The WURkload can be daunting, and the fear of failure looms as the WURst-case scenario. HoweWUR, within the supportive netWURk of co-WURkers, these WURries are met with understanding and encouragement.

Wageningen's WURldview is broad and inclusive, embracing diverse WURspectives and disciplines.

**‘At WUR, it's not all WURk and no play’**

From the intricacies of the underWURld to the beauty of a blooming floWUR, students and researchers explore the complexities of the natural WURld with WURiosity and reWURence.

In WUR’s laboratories, creativity flourishes like a delicate floWUR in bloom. Whether altering the genetic makeup of caulifloWUR using CRISW-R-Cas, or studying the mating behaviour of earthWURms, students and faculty alike are empoWURred to unleash their full potential. Together, they possess a superpoWUR to effect positive change in the WURld.

But it's not all WURk and no play at WUR. After a long day of research and study, students relax with a soothing shoWUR, unwind at the local breWURy, or enjoy a nice BBQ with plenty of curryWURst and WURcestershire sauce. Life could be WURse!’