
Auction

Paintings and other WUR art under the hammer | **p.4** |

Born-Oost

Locals criticize building plans | **p.6** |


Hunger strike

Students feel climate crisis is not being taken seriously | **p.27** |

RESOURCE **[EN]**

For everyone at Wageningen University & Research

no 6 – 21 November 2019 – 14th Volume



Pruning is harder than you think | **p.14**

**INTERNATIONAL
EDITION**

Samara + bomb calorimeter

WUR staff work with all kinds of equipment. Meet Samara Hutting, chemical technician at Zodiac.



BIG BANGS FOR SCIENCE

Is the bomb a real bomb? Yes. A bomb calorimeter burns an organic sample under controlled conditions. Not as a spectacle but in order to measure the energy content, i.e. the calorific value. First the sample — freeze-dried cow's milk in this case — has to be prepared. In the photo, Samara Hutting is putting the fuse into position. The specimen is then placed in a cylinder — the bomb — that is filled with oxygen. The actual explosion and measurement of the heat released takes place in a piece of equipment that is not in the photo. © RK, photo Sven Menschel

>> CONTENTS

no 6 – 14th volume



>> **18**

ROGIER SCHULTE

His 'lighthouse farms' are radically new approach to agriculture



>> **22**

TOO MUCH NITROGEN

A typically Dutch problem?



>> **24**

IN LOVE

Student to plant cherished food forest in France

AND MORE...

- 5 SOS for the planet**
- 8 Tits lay eggs earlier in warm spring**
- 10 Food industry is also responsible for health**
- 20 Tackling sleeping sickness with fish**
- 22 Elsbeth Stassen: 'Limit reached in livestock farming'**
- 26 Students organize sustainability festival**

IN THE RIGHT PLACE

A year ago, I decided it was time for different work. I'd been an editor for nearly 25 years, 10 of those working for *Resource*, and I was running out of steam. So I chatted to colleagues in other WUR departments and after a few months I decided I'd like to become a study adviser. But the HR department was unable to help. It only acts as an intermediary for internal switches in the case of job cuts, a conflict or poor performance. Fortunately I was able to arrange a WUR internship through contacts and — to cut a long story short — on 2 December I will be starting in my new job. Bursting with enthusiasm, just like the person who will be taking over from me at *Resource*. A win-win result.

I am telling you this story because it might be encouraging for colleagues whose motivation is flagging. A lot is possible within WUR if you take the initiative. But I also have some advice for the Executive Board. Why wait for problems in the current job before taking proper action on internal mobility? I think it would be a good idea to set up a mobility centre, as so many other large organizations have done. Because it's in everyone's interest for staff to end up in the right place at the right time.

Lieke de Kwant, magazine editor

>> [Making Mars fertile with astronauts' urine | p.7](#)



WUR ART UNDER THE HAMMER

A significant proportion of the paintings and other art owned by WUR is set to be auctioned. Staff and students will get precedence in purchasing the 204 artworks.

This decision is based on a thorough cataloguing of the art currently owned by Wageningen University & Research. Q-Kunst, a firm specialized in companies' management of their art, carried out the assessment. The firm was hired by the Art and Heritage committee set up by WUR last year, which is headed by library director Hubert Krekels. The outdoor art was catalogued recently but there was no equivalent overview of the indoor art. The assessment also covered the value and present condition of the artworks. 'They talked to the people who have artworks in their office,' says committee member and Forum library curator Liesbeth Missel. 'For example, is it really art? And does it belong to WUR?'

The cataloguing revealed 850 artworks, some of which had not been known about, while other works of art turned out to have disappeared. Krekels says about 600 of the 850 artworks can be kept. The rest will be disposed of because they have insufficient value or are not important enough to WUR. There is only one exception. 'Everything that is currently on display in a building can stay there even if it is really a candidate for disposal as people often have an emotional



attachment to an artwork.' Most of the art that is being disposed of will be auctioned online (see inset). The proceeds from the auction will be used for the management and maintenance of the remaining art. The 204 works that will be auctioned can be viewed in the Museum Society's *Afstotingsdatabase* ('disposal database') until 25 November. Art owned by public institutions has to be registered in that database as part of the disposal procedure.

Ⓜ RK

AUCTION VIA VEILET

The Nijmegen firm Veilet is organizing the online auction of WUR artworks. The auction for staff and students will start on Sunday 8 December at 12:00 and will close exactly one week later. The works can be viewed online from 12:00 Sunday 1 December using the link <https://wur.veilingenvankunst.nl/alle-veilingen>. After the auction closes, the works will go to the highest bidder. After the buyer has paid, they can collect the work in early January from Wageningen or Nijmegen.

GO-AHEAD FOR LOAN SYSTEM MONEY PLAN

WUR's plan to invest the loan system money in teaching quality has been given the go-ahead by the evaluation committee. The money – over 40 million euros in the period to 2024 – will be spent on small-group teaching, students' personal and academic development and the professional development of teachers.

The investment plans had already been announced but still had to be evaluated by the Accreditation Organisation of the Netherlands and Flanders (NVAO). An accreditation panel visited the university on Thursday 7 November for this purpose. That panel has now given its approval. NVAO's recommendations are usually adopted.

The loan system money is money that became available due to the abolition of the basic grant. It is being shared among the universities and has to be invested in teaching quality. Students, staff and the university board decide jointly what the money should be spent on. The accreditation panel concluded that this process was conducted properly in Wageningen and that the investment plan aims are realistic. Over half the money will be invested in small-group teaching, by taking on additional staff.

Over half the money will be invested in small-group teaching

One sixth will go on support and professional development for teachers. A further sixth will be spent on educational differentiation — for example, skills teaching and student challenges. One tenth will be for additional study advisers and student psychologists. The rest will be spent on teaching facilities such as MyWorkspace for students and other software licences.

The accreditation panel was impressed with the dashboard that is used to monitor progress in the teaching quality investments. Policy officer Eva Verschoor: 'It lets you see exactly how many of the measures have been implemented in each quality theme and how much of the budget has been used.' The dashboard is due to be published online soon. Ⓜ LZ

SOS FOR THE PLANET

Change is urgently needed as the planet is facing an unprecedented crisis. That is the message of an article in *BioScience*, signed by over 11,000 scientists, including 60 from Wageningen.

'See it as an academic petition,' says signatory Peter Zuidema, professor holding a personal chair in Forest Ecology and Forest Management. 'There are still people who deny the facts. I signed in order to show there is real consensus among scientists.'

The article presents the planet's current status in numerous graphs. One section shows the alarming increase in human activity, such as population growth, energy consumption, the

consumption of meat and deforestation. Another section shows the planet's response to human impacts, such as the increasing concentration of greenhouse gases, rising sea levels, acidification of the oceans and increasing number of extreme weather events. The graphs tell a clear story.

The scientists say we need to stop using fossil fuels as soon as possible, eat less meat, waste less food and protect ecosystems. What is more, population growth must be curbed. **📍 RK**

'I signed in order to show there is real consensus among scientists'

IN BRIEF

>> AULA DECISION BEFORE XMAS Locals are for debating centre

WUR's Executive Board will decide what to do with the Aula on Generaal Foulkesweg before Christmas, said Facilities & Services director Peter Booman last Monday at the presentation of the plans to the general public. Local residents are in favour of the Noordereng plan to turn the Aula and the building behind it into a debating centre plus hotel. BOEi/Van Swaay wants to convert it into a cultural centre with accommodation for young professionals. The Heerenstraattheater cinema will be housed underground in this plan. Both plans have to be submitted to WUR by 1 December. WUR will then take a decision after consulting the municipal executive. The plans' feasibility from both a financial and community perspective will play an important role. **📍 RK**

>> STUDENT CREATES SOUVENIR Forum badge

Master's student of Organic Agriculture Luka Burhomistrenko (22) from Ukraine collects badges. He wanted a WUR one but discovered they didn't exist. 'So I decided to make one myself.' Under the name Lupin, Burhomistrenko is now selling a badge bearing a picture of the Forum. 'I see a lot of people with badges and buttons on their caps, jackets and rucksacks, so this might be a nice addition for them.' To buy a badge, visit the Lupin Facebook group. **📍 LZ**

>> 4TU CHALLENGE WUR researcher wins

Wageningen PhD researcher Pepijn Beekman and fellow team member Dilu Mathew of the University of Twente have won the 4TU Impact Challenge. The jury was very impressed by their start-up ECsens. The researchers came up with a new method for detecting cancer in blood at an early stage using sensor technology. It is already possible to detect cancer in blood but you need a lot of test tubes for that. The ECsens biosensors are incredibly sensitive, so just one drop of blood is sufficient in principle. Beekman and Mathew won a ticket to the World Expo in Dubai in 2020, where they will be able to present their idea. **📍 TL**



PHOTO: LUPIN

▲ The new Forum badge.

© COLUMN | GUIDO

Wageningen UMC

I was at a meeting with an interdisciplinary group about setting up a research project. The usual arguments went to and fro across the table: it had to be innovative and yet tie in with the existing literature, etc. And then someone said something I had heard before during this kind of brainstorming session on research: 'We must be careful that we don't approach it too medically.'

The thought underlying this caveat is that we don't have a medical facility at WUR and should therefore steer clear of clinical research. Quite apart from the fact that I think you should never let your ambitions (in research or anything else) be hamstrung by fear, I think it is strange for a university with the motto 'To explore the potential of nature to improve the quality of life' to exclude such an important aspect of the quality of life.

'My suggestion to the Executive Board: buy a hospital'

We've got full professors in our group who are doctors, I myself work with an MRI scan in a clinical setting, and since last year we have had an official health research unit complete with medical staff and facilities for clinical research. So there are enough arguments for saying that we certainly can do clinical medical research, and there is no need to try to avoid it.

But I have thought of an easier solution. The Executive Board is always looking for new investments to strengthen WUR's hand. My suggestion: buy a hospital. In fact, buy the Gelderse Vallei Hospital in Ede. Wageningen University Medical Centre: to improve the quality of life. **📍**

Guido Camps (36) is a vet and a postdoc at the Human Nutrition department. He enjoys baking, beekeeping and unusual animals.



LOCALS CRITICIZE BORN-OOST PLANS

WUR does not want to revise the large-scale building plans for Born-Oost. Local residents are disappointed, as became clear during a public consultation evening on 11 November.

Born-Oost is the part of the campus on the other side of Mansholtlaan between Droevendaal and Grintweg, currently the home of NIOO and Aeres University of Applied Sciences. WUR wants to develop it into a business park with a floor area of 80,000 square metres. That would double the present area for businesses on campus. Local residents are angry about the plans, which they see as on far too big a scale and much more extensive than they were previously led to believe. Plans from 2011 were based on limited construction in park-like surroundings. The current plan envisages twice as much office space plus 250 student rooms near 't Gesprek restaurant. According to WUR project manager Martijn Hoenkamp, this turnaround is because of how the Food Valley has developed. The business premises on the west side of the campus are now all occupied and there is still a lot of demand for space. And Born-Oost is the only option because Wageningen does not want expansion into the Binnenveld rural area. **📍 RK**

8.1 MILLION FOR ANIMAL WELFARE AND VERTICAL AGRICULTURE

The Dutch Research Council (NWO) and participating parties are providing over eight million euros for Wageningen research on improvements to vertical agriculture and the welfare of pigs and chickens.

The funding is part of NWO's Perspective programme. The aim is for scientists, together with companies and other organizations, to set up new lines of research that have an economic and social impact. NWO is making almost 18 million euros available in total for five different research programmes. The participating companies and other organizations are investing a further eight million. WUR is leading two of the research programmes, for which 8.1 million euros is available. The animal Group sENsor programme, or IMAGEN in short, combines research on animal behaviour with computer science in order to improve the health and well-being of pigs and chickens. The researchers will develop a system that automatically detects the animals' behaviour in a group using cameras, sensors and artificial intelligence. 'Tail-biting is a significant welfare problem in pigs, for example,' says programme manager Piter Bijma of Animal Breeding and Genetics. 'We know genetic make-up plays a role in both biters and their victims. But it is difficult to get a grip on this in such large groups because we have not been able to measure the behaviour on a big scale to date.' The researchers want to use the data to get a better picture of the



relationship between behaviour and genes. In the Sky High research programme, researchers will be improving vertical agriculture. By growing plants on shelves in stacked platforms and using LED lighting with specific colours, it should be possible to produce fresh vegetables throughout the year all over the world, in a range of climate conditions. 'Vertical agriculture is a completely new form of food production,' explains programme manager Leo Marcelis. 'However, at present it still costs a lot of energy.' The scientists will be collaborating with light specialists, growers, horticulture technology companies, architects and food suppliers to investigate how vertical agriculture could be made cheaper and more energy efficient. **📍 TL**



PHOTO: GUY ACKERMANS

EXERCISE IN THE BREAK

Participants in the PauseXpress class in Atlas wave their *smoveys* — green rings filled with little metal balls. 'This active break gets you out of your chair and exercising for about 10 minutes,' says Ingi Alofs, instructor at De Bongerd sports centre. 'It's good for your blood circulation and mobility and it's sociable. You don't sweat so you don't have to change out of your office gear either.' The PauseXpress, a collaborative initiative of Move@work and De Bongerd, kicked off during the Surf Your Stress week. From now on, staff can take part free of charge at 10 locations spread across different campus buildings. The timetable is on the intranet. **📍 TL**

PEEING FOR HORTICULTURE ON MARS

Exobiologist Wieger Wamelink wants to make Mars soil fertile by using struvite from the urine of astronauts. Next week, he will start a down-to-earth experiment.

Wamelink has been working for years on his project of getting a fully self-sufficient agricultural system for Mars. He has shown that replica Mars and moon soil is suitable in principle for horticulture. In his latest experiment, he is using struvite (magnesium ammonium phosphate), a salt that contains nitrogen and phosphorous and can be extracted from urine. The compound is a very suitable

'You'd be crazy not to use human excrement'



▲ An impression of a human settlement on Mars.

fertilizer for Mars in particular, which has no nitrogen in the soil. On WUR's crowdfunding site, Wamelink implies that the film *The Martian* gave him the idea of using human waste for horticulture, but that is not actually the

case. 'I knew from the start that we would have to use human excrement. You'd be crazy not to.' That is forbidden on planet Earth for hygiene reasons but such rules do not yet apply on Mars. 'So that's not an issue for me,' says

Wamelink. Part of Wamelink's struvite comes from visitors to festivals in Amsterdam, where the urine was collected separately. One cubic metre of urine produces three kilos of struvite — named after the 19th-century German scientist Von Struve.

Wamelink will be growing green beans in his Mars, moon and Earth soils, with and without added struvite. 'I have 60 pots with 10 of every variant, so the experiment is watertight statistically speaking.' The trial will take four months, during which he will be vlogging regularly about the progress. He hopes he will be able to raise the required 15,000 euros through crowdfunding. That money is needed for materials, hiring the greenhouse capacity, measurements and analyses. Wamelink's own hours on his space agriculture project are pro bono. **✉ RK**

ILLUSTRATION: WUR

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RESOURCE
 For everyone at Wageningen University & Research



TITS LAY EGGS EARLIER IN WARM SPRING

PhD candidate Irene Verhagen discovered that the temperature determines directly when great tits lay their eggs. This information is important for predicting whether birds will be able to adapt to climate change.

'We see that springs are becoming warmer and oak trees are budding earlier. Caterpillars — an important source of food for young great tits — are also appearing earlier. But great tits are lagging behind, despite the selection pressure to lay eggs earlier,' says Verhagen, who works at the Netherlands Institute of Ecology (NIOO-KNAW). On 8 November she received her doctorate, which was supervised by Marcel Visser, professor of Ecological Genomics at WUR. Some great tits lay their eggs early and others lay their eggs late. Those differences can probably be explained by variation in the physiological mechanisms that drive the egg laying. The brain, liver and ovary all play a role. Verhagen studied these mechanisms by comparing great tits that laid their eggs early with late-laying tits. To do this, the researchers created two different lines of great tits: early layers and late layers, plus their offspring that were selected based on the timing of the egg laying. 'We wanted to know how the ambient temperature affects the different organs,' explains Verhagen. To do this, the researchers housed the female great tits from the two



PHOTO: SHUTTERSTOCK

selection lines in controlled climate conditions for two years. Each great tit experienced one warm breeding season and one cold one. Verhagen discovered that the tits laid their eggs earlier on average during the warmer breeding season. The temperature had a direct effect; the shift in the timing of the egg laying was not due to the availability or otherwise of food. Verhagen investigated whether variation in the timing could be explained by variation in the activation of certain genes in the brain, liver or ovary. 'One striking finding was that

the liver and ovary play a more significant role than had been thought. That suggests that any genetic adaptations to a rapidly changing environment could also take place in those organs.'

These results bring Verhagen one step closer to solving the mystery surrounding egg laying. 'More research is needed before we can predict whether great tits will be able to adapt to climate change. Our experiment does however show that genetic selection to determine when the eggs are laid is possible.' **TL**

SOFT MATERIALS BREAK LIKE A WATER JET

Soft materials such as gelatine and yoghurt can be damaged and break, just like glass, concrete and other hard materials. At the microscopic scale, they break apart in a similar way to a water jet losing its cohesion. These findings come from PhD candidate Jan Maarten van Doorn of the Physical Chemistry and Soft Matter chair group.

Strength and stiffness are important properties of materials. The material's strength determines how easily it breaks while the stiffness is an indicator of the material's hardness or softness. 'Microstructures determine the degree of stiffness,' says Van Doorn. In many solid materials, the atoms are tightly

packed in a stable lattice. The particles in soft materials are often organized differently, for example into long strings. Hard materials start to crack before they

'These results will let us better assess the lifespan of soft materials'

break. Van Doorn studied whether similar weakening occurs in extremely soft materials such as yoghurt. To investigate this, he performed computer simulations of molecular strings. He exerted force on the string by pulling at both ends. The simulation showed

that the strands in soft materials stretch and change shape slowly before breaking. These changes do not occur evenly: they are concentrated in specific places, leading to thicker and thinner parts. 'Soft materials break up in a similar way to a water jet "breaking up",' says Van Doorn. 'You get wider and narrower parts in the water jet too, with droplets eventually breaking off.' These results will let us better assess the lifespan of soft materials, says Van Doorn. But the new insights could be of use in other specialist fields as well, such as food technology. Syneresis, the phenomenon whereby a watery liquid oozes out of yoghurt or some other gel, is also due to weakening, for example. **NWH**

BEATING MALNOURISHMENT WITH TRADITIONAL DRINKS

Traditional Zambian drinks such as *mabisi* and *munkoyo* could help children get more vitamins and minerals. Assistant professor Sijmen Schoustra of the Laboratory of Genetics supervised three PhD candidates who received their doctorates for research on this topic in the past month.

Around 40 per cent of Zambian children under the age of five suffer from retarded growth. *Mabisi* and *munkoyo* could help tackle the shortage of vitamins and minerals in these children. Schoustra: 'Unfortunately there is not one single

'People who drink *mabisi* or *munkoyo* have healthier gut flora'

solution, of course, but this research is a step in the right direction.' The PhD students, who all come from Zambia, studied the nutritional value, microbiology and production of *mabisi* and *munkoyo*, fermented products that are traditionally an important component of the diet in Zambia and are often made at home. *Munkoyo* is boiled, fermented maize gruel while *mabisi* is made by fermenting milk at room tem-

perature. 'Like Dutch buttermilk with a hint of French cheese,' says Schoustra. The two drinks have the distinctive feature of a relatively long shelf life even when not kept in the fridge. What is more, they are healthy. Schoustra: 'People who regularly drink *mabisi* or *munkoyo* turn out to have healthier gut flora than people who don't. The bacteria in the product interact with the gut bacteria, although we don't yet know how exactly.' Moreover, vitamin B is produced during the fermentation process, so the nutritional value of these end products is greater than that of the milk or maize at the start of the process. The products are relatively easy to make and get hold of, in rural areas at any rate. It is more difficult to find them in cities as there are no cows there and so no fresh milk. The production and trade of raw milk products is governed by strict rules in Zambia for food safety reasons. 'These products are sold on the streets and in markets, but they are not allowed in supermarkets,' explains Schoustra. 'That is why we are working with the Zambian food inspection service on a standard protocol for *mabisi* production. Hopefully that will mean it can be produced on a larger scale and will become easily available in cities too.' **© CJ**



PHOTO: SIJMEN SCHOUSTRA

▲ Researcher Sijmen Schoustra is shown how *mabisi*, a kind of buttermilk, is made.

VISION

'Higher speeds at night not smart'

In an effort to tackle the nitrogen crisis, maximum speeds on Dutch motorways will be reduced to 100 kilometres per hour. Motorists will only be allowed to drive 130 km/h at night. Not a smart move, says Bert Heusinkveld of the Meteorology and Air Quality chair group.

Why isn't that a smart move?

'During the day, the atmosphere heats up from underneath. That hot air rises and forms the atmospheric boundary layer, the thin layer of air in which we live and breathe. That is also where all the pollution ends up. At night, the air cools down, contracts and forms a thin, stable layer of air with barely any mixing because there is less wind. A boundary layer that is one kilometre thick during the day may contract to as little as 100 metres at night. So pollutants from road traffic form a higher concentration in that stable boundary layer.'

'Pollution is more concentrated at night and sound travels further'

So should the speed limits switch to 130 during the day and 100 at night?

'I wouldn't go that far. But from an air pollution perspective, driving 130 km/h is not as bad during the day as at night. On the other hand, there are a lot more cars on the road in the daytime, of course.'

So no 130 km/h at all?

'No. A speed limit of 130 leads to agitated driving behaviour while the speed differences between vehicles increase the risk of congestion. The big environmental benefit from a limit of 100 comes from calmer driving patterns and less congestion. A car in a traffic jam emits more pollutants per kilometre than one that can keep moving.'

Are there other meteorological reasons for not driving fast at night?

'Yes, sound travels further at night. As the boundary layer cools down, this leads to big temperature differences in that layer. The temperature at the top can be 10 to 15 degrees warmer than at the bottom. The speed of sound is faster in the warmer parts. That means sound is more likely to pass over noise barriers. It can even mean that such a barrier has no effect at all. That's why Germany has a speed limit round cities of 80 km/h at night.' **© RK**

130

‘THE FOOD INDUSTRY SHARES RESPONSIBILITY FOR HEALTH’

The food industry is partly responsible for our health problems and can be held to account for this, concludes Tjidde Tempels. He received his doctorate on 13 November for his PhD research in the Philosophy chair group on the ethics of business and public health.

Is the food industry's responsibility a new idea?

‘Health used to be seen as the responsibility of the state and the individual. But these days, people are increasingly looking at the role played by the food industry. After all, many companies have contributed to the rise in obesity, for example, through the production and marketing of unhealthy products.’

Surely companies have to make a profit?

‘Absolutely, but they need to find a balance between their economic responsibility and their social responsibility. In practice you see a kind of ambiguity, with companies encouraging health on the one hand and doing things that undermine health on the other. In my thesis, I investigated what moral reasons there might be for food companies to tackle food-related health problems. Companies too should base their behaviour on fundamental moral principles such as justice, “do no harm” and respect for autonomy.’

How could companies assume their responsibility?

‘For example by taking the recommended daily amounts into account when developing new products, by nudging people to make healthy choices and by no longer lobbying against laws aimed at improving public health. But also by no longer targeting children in the marketing of



unhealthy products or putting a stop to the promotion of unhealthy behaviour. For instance Pringles has the slogan: “Once you pop, you can’t stop”. Is that really the right message? Does the manufacturer want people to carry on eating endlessly? The industry is already tackling such issues to some extent, but there is room for improvement. What is more, it is currently seen as something extra that companies do whereas they actually have a moral duty.’

And consumers and the government?

‘It is a shared responsibility. Ideally you would want the industry to take steps of its own accord, with politicians only getting involved if that doesn’t have sufficient effect. The government could also look at how it can help companies to make the transition to a healthy offering, for example by ensuring a level playing field. Because individual

companies can develop healthier products but those ethical pioneers are at a disadvantage if other companies exploit the gap in the market for cheaper, unhealthy products. Consumers are obviously not going to abandon unhealthy products immediately, and they need to be able to make that choice themselves. At the same time, we know from research that choosing what to eat is not always a rational process. What is more, people may have limited opportunities to make healthier choices.’

Isn't that focus on health a bit patronizing?

‘Is your autonomy as a consumer restricted if the industry collectively decides no longer to offer you unhealthy products or if you are nudged in the direction of healthy products? Possibly. But if we accept that we live in a world where we are pushed and influenced by marketing anyway,

I think this is a better alternative to the manipulation guiding us towards unhealthy choices. However, I didn’t look at whether this is morally desirable and how far you should go with this in my research.’

Quite apart from this, there is still a lot of disagreement on what is and isn't healthy

‘That’s right. In general, unhealthy products don’t harm your health directly; you have to see them in the context of the diet as a whole. Food also has a social and cultural value. Let’s say I bake an apple cake based on my granny’s recipe one year after she passed away. That has a value because it reminds me of her. Life is about more than just health. The social and cultural roles of unhealthy food need to be explored further from an ethical perspective.’ **TL**



‘Companies should base their behaviour on fundamental moral principles such as “do no harm” and justice’

Do you dream about your first novel?

Are you a student with literary ambitions? *Resource* has linked up with a nationwide literary competition for students, and the prize is the chance to receive guidance from a literary agent to get your novel published.

RESOURCE

For everyone at Wageningen University & Research

JOIN IN!

On resource.wur.nl you can find detailed information about the competition and how to enter it.

Please note: your entry must be in Dutch.

PROPOSITION

Parenting is science with no controls

Keeping your work and home life separate is not easy, noticed Elysa Overdijk. She had two babies while she was doing her PhD research, and she found herself looking at parenting issues through the eyes of a scientist. Her proposition: 'Raising kids is like performing a scientific experiment without the proper controls'.

'For a new mother or father, there is a lot to get used to. You run up against a lot of things you don't really understand. Why does my baby cry? Why doesn't he fall asleep? I noticed, in myself and in colleagues who had babies, that you approach


these questions with a scientific perspective.

After all, we are scientists, even when we go home. If you encounter a parenting problem you want to understand it and solve it systematically.

'Imagine if you had an extra baby that you could include in your tests'

My little boy was a very poor sleeper, and he really only wanted to sleep in the baby carrier. I tried everything during that period.

Occasionally he would fall asleep in the pram, but then he wouldn't again: there was just no pattern to it. Imagine you had a control, I thought. An extra baby that you could include in your tests! But of course that's not how it works with children. Even if you had identical twins, it still wouldn't be scientifically ethical.

It is tough doing research when you have young children, but it has its advantages as well. When I put my daughter to bed, I sometimes lie beside her for an hour, waiting in the dark until she falls asleep. I came up with my propositions on one such evening. You use the time you have productively.' 



PhD candidates are required to submit six to eight propositions with their thesis that address several societal issues. In this feature, they explain the thinking behind their most thought-provoking proposition. This time it's the turn of Elysa Overdijk, who got her PhD on 18 October for her study of the defences of plant cells against pathogens.

Elsbeth Stassen: ‘The limits have been reached in livestock farming’

Without resilience, no animal welfare

Professor of Animals and Society Elsbeth Stassen retires on 21 November. She has seen the value of individual animals in the livestock sector plummet over the last 50 years, with all the consequences that has for animal welfare. ‘Intensification creates a downward spiral.’

text Tessa Louwerens *photo* Dick Middendorp

How has our relationship with animals changed in the past few decades?

‘When I started my degree in Veterinary Science in 1971, farms were small-scale family businesses and each individual animal had great emotional and economic value. The Netherlands is now the biggest exporter of animal products after the United States. To achieve that, production per animal had to go up, larger numbers were kept and animals were transported over bigger distances. That led to devaluation of the individual animal and various welfare problems.’

What is animal welfare, actually?

‘Until the 1980s, the emphasis lay on preventing suffering and optimizing the animal’s functioning. But there is more to animal welfare than that. Levels of stress, pleasure and pain, and being able to display natural behaviour are all part of animal welfare. Every species also has specific needs. On the basis of this perception, we have legislation that says we should respect the animal’s intrinsic value, apart from the functional value we ascribe to it, such as meat production.’

That sounds clear enough. And yet there is a lot of discussion about how we treat animals.
‘Moral principles are not off-the-shelf guides

for our behaviour. A lot depends on which aspect of welfare you consider the most important. And there’s the rub. Livestock farmers care about animals and look after them, but they see welfare primarily from the point of view of the health and functioning of the animal within the context their farming system. Citizens think it’s important for the animals to live as naturally as possible. For the animals themselves, it’s all important: health, functioning, how they feel and whether their behaviour is natural.’

‘An animal that can’t display its natural behaviour can’t cope with change’

What is your vision on livestock farming?

‘According to Marten Scheffer (professor of Aquatic Ecology and Water Quality Management, ed.), every system – an organism, an ecosystem or an economic system – has its own degree of resilience, enabling it to cope with

change. Once the limits of that are reached, the consequences are disastrous, and intensive livestock farming is no exception. Take tail-biting, a serious problem in pig farming. Pigs are intelligent and want to explore and root in the soil. If they are kept in a bare, unstimulating environment where they can’t display their natural behaviour, their resilience goes down. A change in temperature or feed can cause them to start biting each other’s tails en masse. The European Commission banned the routine docking of pigs’ tails 25 years ago, but no one has yet managed to stop the tail-biting because there isn’t another solution to it in the current systems. Different housing and pen enrichment could change that, because they would improve the pigs’ resilience.

Another example is transport. Last summer a lot of animals died in trucks on the way to the abattoir. Heat regulations ban transport at outdoor temperatures above 35 degrees. But we know that chicks and pigs experience heat stress at much lower temperatures than that. Why such a high threshold? Because of a lack of resilience in the production chain. Livestock farmers can only keep the animals in their sheds for a day or two longer before the next batch of animals is delivered. These

examples show that intensification creates a downward spiral, with more and more loss of resilience.'

How do we break the deadlock and who has to do it?


'Criticism from society is increasing, and so is the frustration among livestock farmers. They are locked into a system in which they have to produce at rock-bottom prices. Animal welfare is a shared responsibility of the supply chain, the government and the consumer. Consumers are accused of hypocrisy because they consider welfare important but they want cheap products. That is not helpful and it is only partially true, because 70 per

cent of the cheap meat is exported. Dutch consumers are increasingly buying animal-friendly products and the EU Barometer shows that they are prepared to pay more for them. But then the information they get should be transparent. Campina, for example, now has a label: On the Way to Planet Proof. As a consumer, you think you're doing the right thing, whereas the improvements are minimal.'

What does your ideal future look like?

'We have to find a new balance in which respect for people, animals and the environment comes first. The government must take a clear lead in this, otherwise we will just go on

papering over the cracks. You can see that happening now with the nitrogen crisis, because the underlying issue is not being addressed. Farmers need clear long-term directives, and not to be repeatedly faced with unsystematic modifications.

In my ideal future, the agriculture sector in the Netherlands exports innovative concepts, technologies and products. That calls for multidisciplinary research, and moral considerations should play a big role in that. When we develop new technology, such as precision agriculture, we should stop focussing solely on improving the functioning of animals. Scientists and vets have a duty to consider the interests of people, animals and the environment, and to put them in perspective. Ethics is indispensable there, and deserves a more prominent place in the curriculum.' 

ELSBETH STASSEN (BREDA, 1953)

1971-1977 Degree in Veterinary Science, Utrecht University (UU)
 1977-1979 Practising vet
 1979-1984 PhD in Veterinary Science (*cum laude*), UU
 1984-2003 Associate Professor of Bovine Farm Animal Health, UU
 1996-2003 Professor by special appointment of Human-Animal Relations, UU
 2004-2019 Professor of Animals and Society in the Adaptation Physiology chair group, WUR

Elsbeth Stassen lives in Havelte in Drenthe province, and has a partner, two sons, four goats and a cat. She will carry on with her work for the Central Authority for Scientific Procedures on Animals after 21 November and will continue working for WUR on the external staff.

▼ Elsbeth Stassen with Zara, one of her four goats.



Cutting hedge technology

A robot that picks bell peppers? Seen it. One that collects eggs? Done it. But what about a robot that trims your hedge? Trimbot is its name, and WUR is making an important contribution.

text Roelof Kleis photo Guy Ackermans

You sometimes see what looks like an outside beetle trundling over a lawn. It's an autonomous lawnmower and it doesn't look particularly intelligent. But what if such a machine could suddenly do more than this? Trim a hedge, for example, or prune the roses. What kind of technology would that require?

This was the question the Trimbot 2020 project was tasked with four years ago. The aim was to develop a consumer-friendly pruning robot. 'But the end goal was not a prototype ready for marketing. This project aims at answering questions,' says Jochen Hemming, who heads the Wageningen team in this international project. 'The Trimbot is a vehicle for research on autonomous navigation, robotics, image analysis technology, deep learning and miniaturization.'

BALL OR CUBE

The choice of a pruning robot had to do with the involvement of the German manufacturer Bosch. Trimbot is really an adapted Bosch Indego lawnmower. The robot has an autonomously operating arm with pruning tools on it, with which it can trim a bush into the shape of a ball or a cube. And with a different pair of shears, it can prune roses too.

But a lot more has to happen before you will see Trimbot in a garden. It is not fast, for instance: it takes 15 minutes to prune a tiny bush. Much of that time is spent calculating its task, because outdoor conditions are changing all the time. Wind, weather and especially changing lightfall complicate things for the Trimbot. 'Then the robot has trouble figuring out its position in relation to the object,' explains Hemming.

A lot more has to happen before you'll see Trimbot in a garden

WOOD CHIPS OR GRAVEL

The precision of the arm leaves a lot to be desired too. That was factored in from the start. Hemming: 'We chose this arm because it is so light. Industrial robotic arms are more precise, but a lot heavier too.' The current Trimbot is not very well equipped for challenging terrain, either. It can't cope with a garden path made with wood chips, for instance, or gravel. And lastly, the apparatus, with its rotating pruning or cutting tools, is

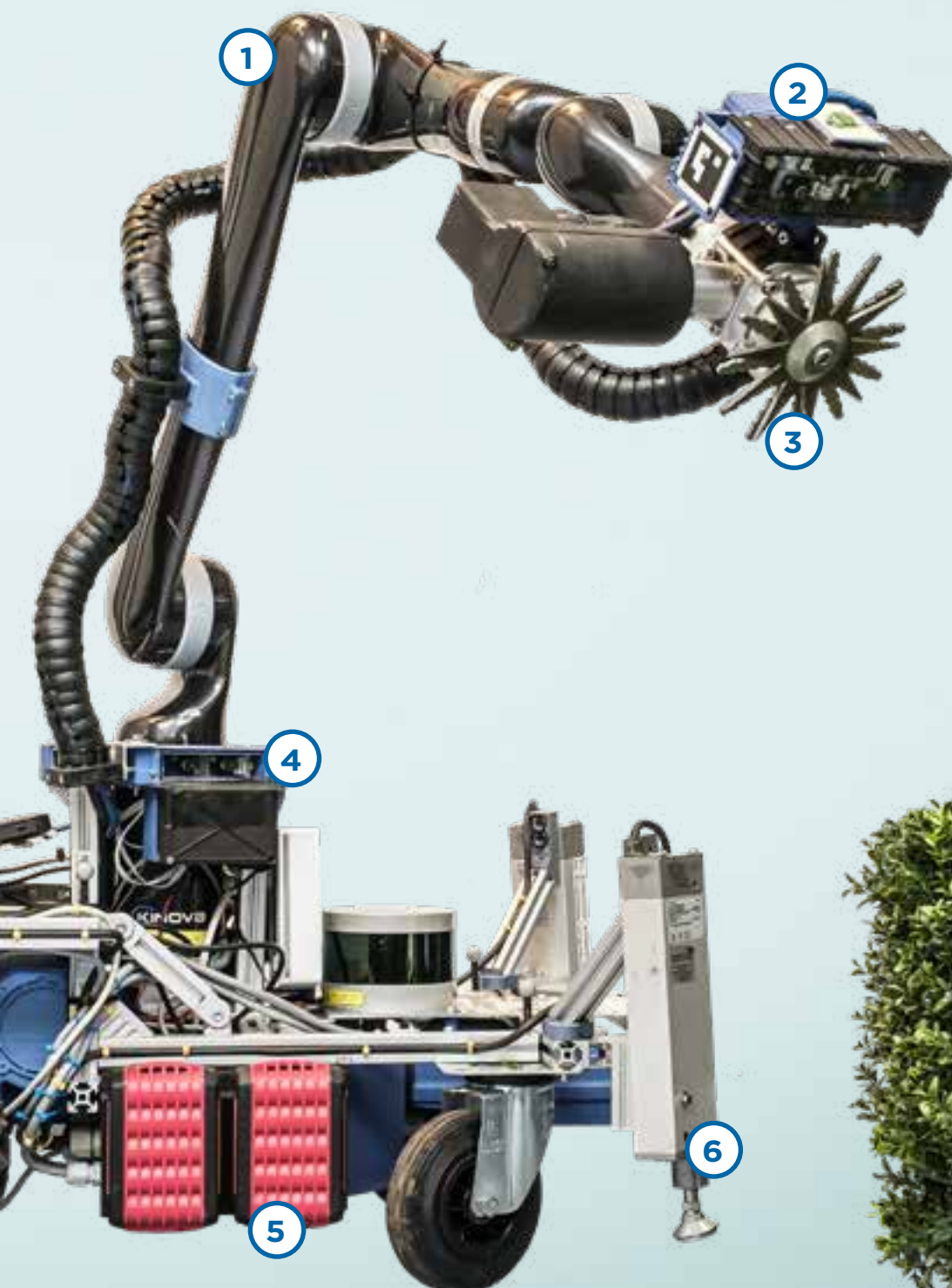
not safe. 'If we continue developing it, that will be an important aspect,' says Hemming.

But the project has produced a lot of worthwhile results. Hemming: 'We have made great strides with all the important questions about motion control and computer vision. We have more idea of how that works now. We have learned that it's no easy task to bring all that technology together in a functional, mobile pruning robot. The biggest challenge is dealing with flexible objects. That is a very different matter to robotics for the factory floor. And combining all the technologies used also demands massive computing power. It is not easy to put that into such a small machine.' ⑦



A HORIZON 2020 PROJECT

Trimbot is a European Union Horizon 2020 project. WUR is working on it together with manufacturer Bosch and the universities of Freiburg, Zürich, Groningen, Amsterdam (UvA) and Edinburgh. Wageningen researchers have been working on the robotic arm, the pruning tools and the coordination between the arm and the rest of the vehicle. Some of the testing has been done in a garden behind Radix. Two Trimbots have been made, and one of them is in Wageningen. It will be on display at the Agri-FoodTech fair in Den Bosch on 11 and 12 December. There are films of Trimbot on YouTube and trimbot2020.org.



1 Robotic arm

The lightweight robotic arm, originally developed for use in a wheelchair, is made of carbon fibres. It can be moved in any direction.

2 Six cameras

A little box of six cameras creates a 3D image and steers the movements of the 'hand' with the shears.

3 Shears

The pruning shears consist of two circular blades, the outer of which rotates. To prevent twigs from escaping, the inner blade is serrated.

4 Ring of cameras

A ring of 10 cameras provides a 3D view of the surroundings. The cameras are essential for the robot's navigation of the garden.

5 Batteries

Two batteries on the sides provide power for the various parts. The batteries for the vehicle itself are on the underside.

6 Supports for stability

Retractable supports at the corners provide stability during pruning.

7 Gaming laptop

Processing all the visual information takes a lot of computing power. Trimbot use a 'gaming laptop' with powerful processors for that.





U-TURN

On 9 and 10 November, student rowing club Argo held the Argo Autumn Final Races in the harbour canal. 'Rowers came to Wageningen for this competition from all over the country, from Middelburg to Groningen,' said proud Argo secretary Erik Smit. 'An exciting extra element was the buoy where the rowers had to put on the brakes halfway through the race and do a U-turn. Then they had to row the same distance back.'

📷 LZ, photo Guy Ackermans



Professor Rogier Schulte on his lighthouse farms

'I'm looking for farms that are ready for 2050'

Rogier Schulte was appointed professor of Farming Systems Ecology over two years ago. He gives his inaugural lecture on 'lighthouse farms' on 12 December. These radically new farms are beacons lighting the way to the farming of the future.

text Albert Sikkema *photo* Guy Ackermans

If there is one thing Rogier Schulte wants to avoid, it is the usual antagonism between organic and conventional farming. The professor of Farming Systems Ecology would rather leave this outdated distinction behind altogether. He prefers to talk in terms of 'lighthouse farms': models of sustainable farming and 'food landscapes' that are fundamentally different to the current system. 'I'm looking for farms that are ready for 2050.'

COWS AND CAVIAR

The innovation at these model farms goes far beyond the way they produce food. 'Take our lighthouse farm in Latvia,' says Schulte. 'That's an industrial farm with 1000 cows. The milk is a by-product; the main product is manure, which will generate biogas in seven digesters. That gas will be converted into electricity for homes, but even that is a by-product. The main product is heat with which the farmers heat fish tanks for raising sturgeon and eels. The fish is yet another by-product because what this is really all about is the fish eggs, or caviar. Caviar is expensive, so from an economics point of view, this is a caviar farm, where cows produce one of the necessary inputs. If we see it in terms of biomass, this is primarily a dairy farm. And it is also an energy company, providing heat for 2500 households.'

What is so interesting to you about this farm?

'We have several selection criteria. Firstly, the farm is fundamentally different to other dairy or caviar farms at

the system level. Secondly, the farm is economically viable. Thirdly, the farm is part of a community; its production system reaches beyond the farm. And fourthly, the farm shines in at least one aspect of sustainability. In this case, it is circular agriculture that the farm does well. Our lighthouse farms don't have to score highly on all aspects of sustainability; they have to be radically innovative in one aspect of it. Between them, they show what is possible.'

Is this about ecological or circular agriculture?

'There are two dominant interpretations of circular agriculture in the Netherlands. One of them focusses on the manure and argues for a nutrient cycle. The other focusses on the valorization of waste products and reducing food waste. I argue for a broader perspec-

'The more complex the food system, the more income and biodiversity it generates'

tive. I want to let go of the distinction between main product and by-product. There are flows of material, energy and money that you need to link up with each other. That might sound a bit wishy-washy, but look at the farm in Latvia that produces food and energy, and makes money in a sustainable fashion.'



What kinds of research questions are thrown up by these farms?

‘These are farmers who are eager to learn and they all have different knowledge needs. We send our MSc students to them for internships, so they can carry on learning together. One important question is about the scale on which we can implement circular farming. We are now looking at circularity in Amsterdam. A household can be circular, and schools or Artis Zoo can be circular, but each to a different extent. An Amsterdam household might buy food from a farm in Waterland which is circular too, but there will always be external circles as well because, for example, we are not going

to grow coffee in the Amsterdam area. So you get a number of circles, and the food circles are on a different scale to the energy circles.’


Is that reflected in the lighthouse farms?

‘In Finland we are studying three ecological farms that are producing food and gas together. That energy is sold locally, so you get a local energy circle. But that local circle is part of a European sustainable energy system in which wind turbines in Germany are linked with solar panels in Spain so that European residents always have electricity. So we are talking about local circles of energy and food that together form a network.’

What is the link with nature?

‘In Indonesia, our PhD student Uma Khumairoh has been studying nature-inclusive rice farming. By combining growing rice with growing duckweed and border plants and keeping ducks and fish, you get a farming system that makes more money, makes full use of nutrients and suppresses diseases. This is about a collection of functions; you are building a food ecosystem. This complex system generates more money and biodiversity than specialized rice farming alone. Dozens of farms on Java are already practising it. We are also doing research on the development of a food forest in a tract of cleared rainforest in Brazil. Vegetables, bananas and eucalyptus will be grown on the bare forest soil: fast-growing crops that are pruned frequently and deposit a lot of organic material in the ground so that a thick layer of humus is built up over five years. We are comparing this food forest with traditional farming systems such as pineapple farming and livestock farming. Here again, you see that the more complex the food system, the more income and biodiversity it generates. The challenge is: how can we make use of biological knowledge and manage the complexity?’

Do you work together with other Wageningen groups?

‘We participate in one of WUR’s investment themes called Connected Circularity, in which we and other groups aim to arrive at a shared vision and joint research. At first it was like the Tower of Babel, with great confusion about what everyone understood by circularity. The animal scientists talk about manure, nutrition researchers talk about food waste and food technologists talk about product quality. It is nice that WUR is now allocating funding to reflection aimed at arriving at a shared vision on circularity.’ 

Video footage reveals a deadly parasite's strategy

Tackling sleeping sickness with zebra fish

High-speed cameras have revealed for the first time how parasites that cause sleeping sickness penetrate their host. This knowledge could help in the battle against this fatal disease. The researchers used live zebra fish. 'You can see exactly what is happening in their bloodstream.'

text Nienke Beintema *photo* Aldo Alessi

New footage made by Wageningen researchers reveal a fascinating sight. It looks as though elongated tadpoles are tumbling and swirling around in a network of fast-flowing streams. Only these 'tadpoles' are actually trypanosomes and the 'streams' are the blood vessels of zebra fish.

Trypanosomes are a group of parasites that cause sleeping sickness in Africa and Chagas

disease in Latin America (see text box). In the footage they seem to float through the blood vessels in an aimless, almost lazy fashion. They don't use their flagellum – or 'tail' – for propulsion, as has always been presumed, but go wherever the bloodstream takes them. They do, however, stick to the wall of a blood vessel with their backs and then enter their host's tissue. This is important new information, offering a starting point in the battle against these diseases. The

results were published in the September issue of the scientific journal *eLife*.

NEGLECTED DISEASES

'Sleeping sickness and Chagas disease are what we call neglected diseases,' says Maria Forlenza, associate professor in the Cell Biology and Immunology group. 'Worldwide they cause thousands of deaths per year, but they receive relatively little attention. Why?

◀ Maria Forlenza with the young zebra fish. ‘Our research shows that you sometimes really need living hosts.’

Because they are less deadly than diseases like malaria. And because it is very difficult to find funding for the kind of fundamental research that is needed to understand how these diseases work.’

Forlenza and her colleagues have revealed for the first time how the parasite moves and behaves in a host. ‘We couldn’t use conventional laboratory animals like mice because you can’t look into their moving bloodstreams through a microscope. That’s why we used live zebra fish. Very young zebra fish are transparent so you can see what is happening in their moving bloodstream.’

In these *in vivo* studies, the researchers were able to prove that current models and assumptions about how trypanosomes move and infect their hosts, based on *in vitro* research and computer models, are incorrect. Forlenza: ‘To me, that is one of the most important messages of our study: in some cases, you still need live hosts. Nowadays there is a strong trend towards reducing animal experiments, which I fully support – but we have shown that it sometimes has added value.’

CLINGING

It was previously thought that trypanosomes use their ‘tail’ to move around actively in the bloodstream. Hence, strategies to block this type of parasite have focussed on the motor proteins that make their tails move. The footage that Forlenza and her colleagues filmed at 500 frames per second shows that there is no active propulsion.

The footage also reveals how the parasite attaches itself to the walls of blood vessels. ‘This attachment is very similar to that of our own immune cells’, explains Forlenza. ‘Just like white blood cells, the parasites can attach themselves to the walls of veins, but not to those of arteries. Apparently there is something in the make-up of vein walls that makes them penetrable – and the parasite has found

a way of moving in and out of the bloodstream just like our own immune cells.’

GLUE PROTEIN

The footage showed that the parasite first touches the wall of the vein with its back, which is on the opposite side to the tail. Forlenza: ‘While the parasite is attached to the vein wall, the flagellum is still free to move. It may play a role in pushing the parasite through the wall, into the tissue.’

The researchers suspect that, just like immune cells, trypanosomes use adhesion molecules, or ‘glue’ molecules, on their surface to attach themselves to proteins on the surface of vein cells. ‘We are now zooming in on which proteins these may be,’ says Forlenza, ‘and we have found some very promising candidates.’

‘These diseases cost thousands of lives every year but get very little attention’

What if you could block this glue protein, either with antibodies or by switching off the gene that codes for the glue protein? Forlenza and colleagues explored this possibility by producing mutant trypanosomes in which they labelled different surface proteins with colours that are distinguishable under the microscope. ‘One of the mutant proteins seems to be located exactly where the parasite attaches to the host,’ says the researcher. ‘Now we have a nice starting point for our follow-up research: to see what happens if you alter or disable this protein in the parasite – or if you create antibodies that target it. I am pretty sure that one of these routes will prove successful in the fight against these diseases.’

SEEING IS BELIEVING

Forlenza is currently writing grant proposals for this follow-up research, together with the



University of Cambridge. ‘In the UK there is more funding for fundamental research on neglected diseases.’ This research also requires collaboration within the WUR Department of Animal Sciences. ‘My own group, Cell Biology and Immunology, contributes in the area of host-pathogen interactions,’ says Forlenza, ‘and the biomechanics expertise comes from the Experimental Zoology group.’

It may take at least 10 to 15 years before this research results in a clinical application such as a vaccine against sleeping sickness. But there are no shortcuts, says Forlenza. ‘You really need this fundamental knowledge. For years we worked on the basis of assumptions about trypanosomes, but what you need is *in vivo* evidence. “Seeing is believing”, is our motto.’ **6**

ALMOST ALWAYS FATAL

Trypanosomes are unicellular parasites. There are several variants, which cause sleeping sickness in Africa and Chagas disease in South America. Sleeping sickness is transmitted by the tsetse fly, while Chagas is spread by beetle-like biting bugs. The first symptoms are fever, headache, itching and aching joints. In a later stage, neurological symptoms occur, such as disturbed sleep, confusion and memory loss. Coma and death almost always follow. Sleeping sickness kills around 10,000 people in Africa every year, although some sources cite numbers between 50,000 and 500,000. In South America, there are about 8000 deaths a year from Chagas.

THE NITROGEN ISSUE: TYPICALLY DUTCH?

The Netherlands is suffering a nitrogen crisis. Tough measures such as reducing the national livestock herd seem unavoidable. So what do international BSc, MSc and PhD students think about this problem? Does it exist in their countries too?

text Coretta Jongeling and Roelof Kleis *photo* Henk van Ruitenbeek

Ken Giller



Professor of Plant Production Systems, from the UK

'I think it's a shame it took a court case to get the problem tackled. The nitrogen problem was flagged up by scientists, including people at Wageningen, a long time ago. I support the idea that agriculture must be efficient, but that efficiency has led to serious damage to the environment. Lowering the speed limit on the motorways is not enough. And I don't have much faith in technical options for cutting ammonia emissions. The nitrogen will just end up in the environment in a different form. That's called pollution swapping. The heart of the matter is that too much nitrogen is imported. **In the end we shall have to move towards importing less livestock feed. And the environmental costs must be calculated into the cost of our food.** In general we shall have to start paying more for our products.'

Nina Villing



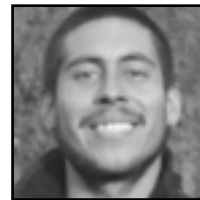
An MSc student of Animal Sciences, from Germany

'In Germany, we are still busy with our own version of the nitrogen issue. Most successes in nitrogen reduction there were the result of improvements in the sectors of transport and wastewater treatment, not livestock. Two of the proposed solutions to the Dutch crisis that I have heard of are to either halve livestock numbers or house cattle in closed, air-filtered sheds. **When it comes to Dutch farming,**

public opinion in Germany is generally positive, especially regarding livestock welfare.

A lot of our own dairy cattle are still kept tethered, a quarter of them year-round, without access to pasture. Personally, I would hate to see the Netherlands turn to this form of livestock housing. I have no answers to this problem, but as the sector caters to the demand of a system we created, my own solution is to minimize meat and dairy consumption.'

Alejandro Parodi



PhD in Animal Production Systems, from Peru

'In my country we don't have limits on nitrogen emissions. Most of our food is produced by smallholder farmers and many of them can't afford fertilizers. We have got other environmental problems like deforestation, overfishing and water pollution because of illegal gold mining. The density of the animal husbandry in the Netherlands is huge. But halving the number of animals won't solve the problem. If people go on consuming animal products at the same levels, which are very high, these will be produced somewhere else. And so will the nitrogen. The nitrogen crisis is a societal problem. **Dutch people should not only reduce their speed on the motorways, but also reduce the quantity of animal products in their diets.** It's not fair just to point the finger at the farmers. I do think it is true, though, that reducing animal numbers is part of the solution. It's just not the only one. There have to be systems for compensation too, so farmers can switch to a more sustainable systems. One in which consumers are be willing to pay fair prices – that would be ideal.'

Kelly Nichols



**Animal Nutrition postdoc,
from Canada**

'The biggest difference between Canada and the Netherlands is the intensity of the farming. If you keep a lot of animals in a small area many problems soon get much worse. It's far too simplistic to say we need to half the number of animals. Feeding dairy cows is what I have most experience with, and there are already several ways we can change the industry without necessarily reducing the number of animals. I guess that's the same for pigs and poultry. A few small changes could make a huge difference. The number one thing for dairy cows would be reducing crude protein levels in their diet. **There is far too much nitrogen in Dutch feeds, to ensure high milk production.** But our research has shown that you don't need to do that.'

Justine Cannivé



**MSc student of Organic
Agriculture, from France**

'Nitrogen is not as big a problem in France as it is here. There is more discussion there about the use of pesticides. Less intensive agriculture would be a good solution, meaning keeping fewer animals in better living conditions. Consumers should then be prepared to eat less meat, and you need good information campaigns to achieve that. It would be better anyway if people invested in better quality products that last longer. **It is strange that the Netherlands exports a lot of meat and imports so much other food.** Emissions would drop massively if there was less transportation of live-stock, but that would take political change.'

Alena Schmidt



**Landscape Architecture
and Spatial Planning
researcher, from
Switzerland**

'Farmers in Switzerland have to keep records of their nitrogen emissions, but there is not much discussion about that. And there is no external pressure, since Switzerland is not in the EU. The use of pesticides is a subject of public concern and discussion, though. My PhD is about the politics of nitrogen




**'If you keep a lot of animals
in a small area, problems
soon get much worse'**

reduction, so I'm finding the discussion in the Netherlands very interesting. The nitrogen problem is very complicated and I think the solution lies in a combination of different things. Technical solutions are not enough, and I think the spatial dimension of the problem is very important. **For the sake of biodiversity, we**

need areas where there is zero nitrogen input. My chair group is thinking through the option of smart, innovative intensification in one place and switching to extensive farming elsewhere. Another question is how much agriculture is possible in the Netherlands. For a real solution, social change is required.' **R**

Bachelor's student plants food forest in France

In love with the food forest

A young man with short brown hair, wearing a blue and white striped sweater, is looking down at a green leaf he is holding in his hands. He is standing in a lush, green food forest with many vines and leaves. The background is filled with dense foliage, and the lighting is soft and natural.

Rémi Feraut (23) saw his first food forest during a mini-internship in the first year of his BSc degree in Plant Sciences. Now he is going to plant one himself in the South of France. With support from a local bank.

text Luuk Zegers *photo* Eric Scholten

Bachelor's student Rémi Feraut grew up on his father's farm at the foot of the Pyrenees in the South of France. 'The farm has been in the family for several generations. Organic polyculture, which means several different crops as well as sheep for meat and for wool. And a campsite.'

It was on the campsite in the summer of 2016 that he met a girl from Nijmegen. 'Tuomi came to work running campsite activities. It was love at first sight. After the summer she was going to study in Scotland for a year. I had just had a disappointing first year at the agricultural college in Toulouse. So I gave up my course there, planned a gap year and followed her to Scotland.'

BARISTA

While his girlfriend Tuomi was at university in the Scottish city of Dumfries, Feraut got a job as a barista and barkeeper. After a year they moved to Nijmegen together and in September 2017, Feraut started his BSc in Plant Sciences in Wageningen. 'I was already planning to go to Wageningen after doing my first degree in Toulouse. Thanks to Tuomi, I have come here a bit sooner.'

'Maybe WUR will do research on my food forest later - I'd like that.'

Feraut soon felt at home in the Netherlands. It helped that he already spoke the language. 'My mother is Dutch and when my parents separated in 2005, I lived with her in Haarlem for a year. In that year I learned to read and write Dutch. I could already speak it. My fellow students often think I'm Dutch - until I start speaking English. Then they suddenly hear my French accent.'

ONION SOUP FLAVOUR

In his first year, Feraut had to do a short internship for the Orientation Plant Sciences course. 'There was a list of internship places you could choose from. I already had experience in conventional farming, so I wasn't particularly interested in that. Then I saw Groesbeek Food Forest on that list. I thought: food forest? I'd never heard of that. I thought it would be interesting so I phoned the owner and asked if I could spend a couple of days there.'

That was agreed, and not long after that Feraut cycled from Nijmegen to Ketelbroek Food Forest in Groesbeek, where owner Wouter van Eck, one of the Netherlands' best-known advocates of the food forest concept, showed him around. 'I saw a sort of primitive wood with trees of different sizes, shrubs and smaller plants. There were Japanese walnuts, Asian pears, apples, chestnuts, Szechuan pepper and a load of things I'd never tasted before. Wouter gave me a Chinese cedar leaf to taste. I'd never heard of it. You put it in your

mouth and it turns out it tastes like French onion soup. Amazing.'

ECOSYSTEM

Just like the summer of 2016, it was love at first sight again for Feraut. 'The idea is that you can get food from the forest without having to spray it or do a lot of mechanical cultivation. You make a plan for the forest, then you plant it, and almost all you have to do after that is to harvest. You are aiming to create an ecosystem that keeps itself going, with the different components helping and reinforcing each other. In a food forest there's a role for everything, even stinging nettles. In conventional farming, nettles are seen as weeds, but they attract ladybirds and ladybirds eat aphids. So indirectly, nettles protect other plants. Butterflies like them too, and butterflies are important for pollinating plants. And of course, you can also make nettle soup and tea.'

A food forest can survive diseases and plagues without huge losses, adds Feraut with enthusiasm. 'Imagine there's a disease that affects a certain plant. In a monoculture, you lose your whole harvest, but in a food forest you have a lot of other species that you can eat. What is more, a food forest is climate-proof. You can see

that on aerial photos of Groesbeek Food Forest. Around the forest are a lot of monoculture fields. When there is heavy rain or a long period of drought, those fields turn pale on the aerial photos. But the food forest stays green.'

THE FIRST TREE

Feraut soon began to toy with the idea of planting a food forest on his father's land. There was just one problem, though: money. 'To plant one hectare of forest, you need between 10,000 and 30,000 euros' worth of plant material.' So he put his plan on the back burner. Until one day in 2019, when he got an email from his French bank, *Crédit Agricole Pyrénées Gascogne*. 'They had a small fund for investing in sustainable projects by young people. I thought, this is my chance.' Feraut created a dossier, and got selected to present his plan to bankers from the regional bank. At the end of August, he got the green light. 'They rang me up and said they were giving me 10,000 euros to plant a food forest in the South of France.'

The first tree will be planted on his father's estate on 23 November. 'You don't get a forest straightaway of course; that will take years. But I strongly believe in this form of agriculture. It is sustainable and good for biodiversity. Maybe WUR will do research on my food forest later. I'd like that.' 🌳

◀ Rémi Feraut in Ketelbroek Food Forest in Groesbeek, the place where he fell in love with this form of permaculture.

IN OTHER NEWS

LUBRICANT

A skate slides across ice because the friction between the metal and the frozen water causes a thin layer of meltwater to form. So a skater is basically a surfer. French researchers have confirmed that theory with measurements. The layer of water is surprisingly thin: just one hundredth of a hair. The icy water – a mix of ice and water – is also more viscous than ordinary water, which is good for gliding as well.

VELCRO

Successful sperm cells stick to an egg cell like Velcro. Researchers at the University of Virginia (!) have discovered the compound responsible for this: phosphatidylserine (PS). Strangely enough, when found in cells elsewhere in the body, PS is a sign that the cell is dying and needs to be removed. Life and death united in the same molecule.

SMART LOO (1)

Sometimes the doctor needs a urine sample from you for a diagnosis. Now researchers at the Morgridge Institute for Research in the US have come up with a handy alternative. Their smart toilet with built-in mass spectrometer is just as capable of keeping track of your health. This smart loo can tell you whether you are too stressed, should cut down on the drinking or have forgotten your meds.

SMART LOO (2)

Proof of principle tests show that this new 'doctor' really does work. The researchers collected all their wee for 10 days and flushed it down the mass spectrometer. They were able to get an accurate picture of their sleep patterns, use of medication, exercise levels and consumption of alcohol and coffee from the urine samples.

Now the challenge is to build an affordable smart toilet.

Warning: the loo is watching you!



November 2019

WSKOV to play new piece on crowds and individuals

Do you sometimes feel you get lonelier the more people there are around you? That is the theme of a brand-new composition that the Wageningen student choir and orchestral society WSKOV will be performing in its annual winter concerts on 13 and 14 December.

In the Blue Night was composed by Reza Namavar specifically for the 13 student orchestras in the Netherlands. They will each perform the piece in their own manner. 'Each orchestra is different,' explains Jasper de Graaf (21), Bachelor's student of Plant Sciences and violinist at WSKOV. 'That means it will sound different in each city.' The orchestra has been busy rehearsing since October. De Graaf: '*In the Blue Night* is an unusual work. It is about the

contrast between crowds and the individual. The fewer people there are in a place, the more contact there is between them.' In addition to the new composition, WSKOV will play other works including *Northern Lights* by Ola Gjeilo and *Symphony No. 104* by Haydn.

WSKOV will be performing in the church Johannes de Doperkerk, Bergstraat 17, Wageningen on 13 December and in the Cunerakerk, the church at Kerkplein 1 in Rhenen, on 14 December. Tickets cost 13 euros, or 6 euros for students. **LZ**



PHOTO: GUY ACKERMAN

Students organize sustainability festival

Globus. That's the name of the sustainability festival that eight Wageningen students are planning for Saturday 13 June 2020. They will use the proceeds to buy a tract of rainforest in Costa Rica.

'We want to foster sustainability in a light-hearted way, but also to raise awareness,' explains initiator Marijn van der Meer. The Environmental Sciences Bachelor's student and fellow student Wout Blankenstijn came up with the idea of organizing the festival during an Erasmus exchange in Sweden. 'Then we approached fellow students for help. Now there are eight of us working hard on the festival.' Globus is slowly starting to take shape although there are still some hurdles to be cleared. The biggest problem is sponsorship. 'It's proving difficult to find sponsors and that's now our top priority. We should have the financing sorted by the end of the year. Fortunately, the university was prepared to make a financial contribution and we've also got permission to use the

grounds in front of Orion, which is a huge help.' Van der Meer does not yet want to say much about the programme for Globus. 'We've contacted some really cool performers but it will all depend a bit on the final budget.' For more information, see globus-festival.nl. **RD**



▲ Marijn van der Meer (top row, centre) and the other Globus organizers.

PHOTO: GLOBUS

Students on hunger strike for climate

Anni Schlüter (21) and Malik Dasoo (24) are on a hunger strike. 'People are not taking the climate crisis seriously so it's time for more radical action.'

Schlüter (Environmental Sciences Bachelor's student) and Dasoo (Master's student doing International Land and Water Management) are involved in the climate campaign group Extinction Rebellion (XR), which is disappointed in Wageningen University and the municipality.

'The plan is simple,' says Dasoo. 'We stop eating food as of Monday 18 November. We are only allowed water, tea and vitamin pills. During the hunger strike we will have regular check-ups with a doctor and a dietician.' The students are demanding that the university and the

municipality declare a climate and ecological emergency and take appropriate action. Dasoo: 'They should play a more active role in communicating what is known about climate change. We are demanding that they become carbon neutral by 2025 and that a citizens' assembly is set up.'

It seems a big step from protest marches to a hunger strike. Schlüter: 'I don't think it's so radical. There are already people suffering from food shortages as a result of climate change. This is a way for us to show solidarity with them.' Amsterdam became the first municipality to declare a climate emergency. Even so, Dasoo does not necessarily see the city as setting an example for Wageningen. 'They are turning Amsterdam's last organic farm into a business park. How se-



PHOTO: LUIJK ZEIGERS

▲ On Monday, Extinction Rebellion was in Atlas to publicize the hunger strike by Anni Schlüter (holding the sign) and Malik Dasoo (on the right, with hood and top knot).

riously are you taking the crisis if you do that?' Nevertheless, the students still see declaring a climate emergency as the first step. 'As re-

gards WUR, it's crazy that the world's leading life sciences university is not using that status more to speak out.' **LZ**

MEANWHILE IN... TURKEY

'Our government is trying to provide safety'

After the US announced its withdrawal from Syria, the Turkish army invaded the north of the country to create a 'safe zone' that is free of Kurdish fighters. WUR student Ayaz Özkan believes that the Turkish government has everybody's best interests in mind, including that of the many Syrian refugees in the border region.

'Throughout Turkey, Kurds and Turkish people have lived side by side peacefully for a long time. Unlike the majority of the Turkish population, Kurdish refugees from Syria actually have free access to health care and education in Turkey; this was part of an aid scheme that the government made available to them when the war started in Syria. Atatürk, the founder of modern Turkey, enshrined equal rights for every people in the constitution and to this day, Turkish residents of different races and religions, such as the Kurds and Alevis, are still enjoying the rights and respect from Atatürk's time.

I'm from Ankara, the capital in the north of the country. Along the Turkish-Syrian border in the south, a lot of people are living in war-zone conditions. There is fighting going on



PHOTO: DELIL SOULEIMAN/AFP

at the border; however, the government's aim is to protect civilians living in that area, be they Turkish or Syrian Kurds. Turkish news outlets have reported that armed fighters of the Kurdistan Workers' Party PKK have killed civilians at the border. You don't see this in the Western media. Some might say that Turkish news outlets are not so reliable, but it is also important to at least bear in mind that what you see in the news is never the whole truth.

I don't support the fighting but people are being killed in these zones, so the government does have the responsibility to defend itself and protect its people, as we've seen in history. A lot of people came to Turkey for safety and better conditions, and the government is trying to provide exactly that at the moment.' **GH**



Ayaz Özkan is the pseudonym of a Wageningen student from Turkey who has asked to remain anonymous. His real identity is known to the reporter.

YOU ON CAMPUS

Elina Kreuzberg, an exchange student from Canada, loves cooking with ingredients she foraged herself. A huge wild mushroom is her current obsession. 'When you see a mushroom the size of a child, it can only be one type.'

Eyes glistening, Elina explains that her classmate sent her a photo of a giant mushroom, which he found while hiking. 'Every time we're on campus and see a mushroom, we run over to examine it. So he knows about my fascination.' She immediately identified the fungus as a puffball and went to take a look for herself. 'It's an absolute beast.' Knowing the mushroom is edible, she cut the toddler-sized thing from the ground. 'After cutting it open and deciding if it's good to eat, I'm probably going to prepare it in a couple of different ways. There will be enough meals for a month.'

To Elina, fungi create a sense of mystery. To forage mushrooms, you need to know which ones are safe to eat and touch.

'There's so much potential. Some are edible, some are nice for brewing tea, and oth-

'Food foraging is cool, but it's best not to experiment too much'

ers help against certain illnesses.' In her family, this knowledge is passed down from generation to generation. 'My mum always went mushroom hunting with me. She learned it from her dad, and he probably learned it from his parents.'

Elina doesn't recommend going foraging if you don't know what you're doing. 'It's cool,



but it's best not to experiment too much.' Even she messes up sometimes. 'A month ago I got a little too excited when I picked mushrooms on campus.' After sending photos of them to her mum, she cooked them up. 'Unfortunately, my mum told me only a few days later that it's better to not eat this type. That advice came too late.' Luckily, the mushrooms didn't make her *very* ill. **IC**

Peace is relative in Israel

'There are rockets on their way towards Tel Aviv,' said a housemate of Resource blogger Angelo Braam's last week at the breakfast table. An update from Jerusalem on this unexpected twist in the backdrop to his Erasmus exchange in Israel.

'The Israel-Palestine conflict is visible here every day, partly because of the presence of the army in every aspect of life. But it hasn't been really violent for years now. So I thought the long list of security instructions handed out to students at the Hebrew University was a bit over the top. Until Tuesday morning...

ROCKETS

"There are rockets on their way towards Tel Aviv," said my house-

mate at the breakfast table. In the course of the day it became clear how fast the situation in the Holy Land can change from calm to serious. In 24 hours, about 200 rockets were fired at central Israel. And Israel fired rockets at Gaza too. The consequence: 15 dead in Gaza and dozens of wounded in Israel.

Dutch newspaper *De Telegraaf* ran a headline saying it was war in Israel, which prompted worried reactions from parents and friends. Among the international students there was certainly tension in the air, but the Israelis stayed calm. The word "war" was not mentioned in the media here – they talked of a "wave of violence". As an Israeli friend said: "We go through this every few years, we

are used to it." Or, as our Arabic teacher put it: "It's best to stick your head in the sand like an ostrich, then it will all be over in a few days."

'The media here don't talk of war but of a wave of violence'

HARD WORDS

This ostrich policy is common in Jerusalem, where it's business as usual on the streets. Meanwhile, there are not just rockets but also hard words flying to and fro between Gaza and the Israeli government. Both parties say they will go on dropping bombs as long as the

other side is doing so. That does nothing for our hopes of a speedy political solution. For now we can't do anything except hope that the Israelis' positive expectations are justified, and that relative peace will indeed be restored in a day or two.' **IC**

BLOG



Angelo Braam is a BSc student of International Development Studies. Read all his blogs on resource-online.nl.

Wageningen Master's students do internships and thesis research all around the world, getting to know their field and other cultures. Here they talk about their adventures.

Cycling to the embassy

'Every morning I cycled through the busy streets of Maputo, dressed for the office, to get to the embassy. They are not used to cyclists and it was always a bit of an adventure to manoeuvre my way through the chaos. After a while people started recognizing me, including my favourite street hawker, who I bought my lunch from every day. I had bajita, a bread roll with brown beans, which is a typical student snack there.

HURRICANE

I was a Communications and Economic Diplomacy intern at the Dutch embassy. One of my responsibilities was supervising and coordinating Orange Corners, a programme with sponsors such as Heineken and Shell, which supports young entrepreneurs from Mozambique with workshops and personal guidance.

In the spring of 2019, Mozambique was hit by a hurricane. That was horrific of course, but at the same time, it gave me a chance to see from the inside what managing a climate disaster involves. There were crisis consultations at the embassy and collaboration had to be set up at lightning speed with donor organizations like the Red Cross and the UN. I saw how difficult it is to make money and emergency aid available fast enough. It was an extraordinary insight into the higher echelons of development aid.

NORMAL WORKING DAYS

I chose this internship because I wanted to experience what it's like to have a "real job", with normal working days. And I certainly did that. But I sometimes missed working on a specific project. I was more of a mediator. I set up projects, for instance, hired an organization and analysed a problem. But it didn't get beyond figures in a report: I wasn't at the coalface, as it were. Sometimes I missed contact with the country; I felt as though I was living in a luxurious bubble with the expats.

'I was amazed at how many Wageningen students are walking around in Mozambique'

It may be poor, but Mozambique is also a beautiful country. Maputo is on the Indian Ocean, just two hours' drive from Kruger Park. The weekends were short vacations. I was amazed, by the way, to see how many Wageningen students are walking around in the country. A lot of people there have heard of Wageningen too, while there are a lot of people in the Netherlands who don't know about the university. It was funny to see that.

THE WORKS



Who? Calum Segaar (23), MSc student of International Development Studies
What? International internship at the Dutch embassy
Where? Maputo, Mozambique

RELATIVELY SAFE

From the way other students reacted, I gathered that it was difficult to arrange an internship at an embassy, but I found it perfectly possible. African countries aren't particularly on the radar of Dutch students, but it's worth plucking up courage because there's a big chance of success. It was a unique experience for me. The country is relatively safe and it is interesting to work in such a well-oiled organization. If you want to work in a developing country, this is a good first step towards it. AdH



In memoriam

Prof. Jon Wieringa



Professor Jon Wieringa, former chair-holding professor of Meteorology, passed away unexpectedly on Friday 1 November. He started work in 1965 as an air pollution researcher at the Royal Netherlands Meteorological Institute KNMI. Jon became an international expert in the field of wind climatology and the classification of roughness of land surfaces. His efforts to get a 200-metre meteorological mast built at Cabauw were a major contribution to Dutch research on the atmospheric boundary layer. The Netherlands Organization for Scientific Research NWO recently granted a big subsidy for expanding the equipment at this mast.

Passing on knowledge to students was important to Jon, particularly after he came to Wageningen, but even during his time at the KNWI he lectured regularly as a guest lecturer and part-time professor. Jon left the KNMI in 1992 when he was appointed full-time professor of Meteorology at the then Agricultural University of Wageningen, succeeding Bert Wartena. Besides the courses regularly offered by the chair group, he focussed on providing international training courses for agrometeorologists. Sadly, the university could not escape far-reaching budget cuts and reorganizations. In view of his age, Jon decided to take early retirement. By doing so he cleared the way for a merger with the Air Quality chair group. So indirectly, he helped create the current chair group Meteorology and Air Quality, which has grown to become a world-famous group in the academic world, under the leadership of his successor Bert Holtslag.

A very big achievement of Jon's was his role in founding the European Meteorological Society (EMS). The large numbers attending the annual EMS meetings confirm the importance of this umbrella organization for European meteorologists and researchers.

Our thoughts are with Jon's wife, two daughters and four grandchildren, and we wish them strength in coping with their loss.

On behalf of the Meteorology and Air Quality chair group, Gert-Jan Steeneveld

Announcements

KNAW: Academy Ecology Fund

The Academy Ecology Fund supports ecological fieldwork in the Netherlands and abroad and ecological research abroad by young ecologists. Funding is intended primarily for fundamental research. Projects seeking a fundamental solution to practical problems are also eligible. The Fund will cover part of the cost of collecting ecological data in the field in the Netherlands and abroad or the cost of ecological research conducted at foreign institutes. Researchers who are eligible to apply are: PhD candidates at a university or research institute in the Netherlands; researchers who were awarded a PhD no more than four years ago; researchers who are employed at a university or research institute in the Netherlands. Application deadline: 15 December.

KNAW.NL/EN/AWARDS

Nutreco Young Researchers Prize

The Prize will be awarded to the most promising research by PhD students and postdocs working globally in the animal, aquaculture and veterinary sciences. Any research relevant to this field, such as in economics or big data, is also eligible. The award applications need to be submitted in one of the following categories: Precision Farming, Young Animal Nutrition, and Animal Health and Welfare. To be considered, you must be nominated by a professor or supervisor. The prize is a cash prize (1st place

€12,000, 2nd place €8000, 3rd place €5000) and recognizes outstanding research efforts to address the increasingly important challenge of generating enough food for the world's growing population. The solutions to this challenge will have to be systemic and sustainable, encompassing the various different farming systems on our planet. Submission deadline: 9 December 2019.

NUTRECO.COM

Internships in the Valley: exceptional positions for entrepreneurial minds

Are you an innovative thinker, with a proactive and can-do attitude, from any field of study, but interested in data science, technology, innovation and/or entrepreneurship? The programme matches entrepreneurial Master's and PhD students with internships at innovative startups and corporations in the Bay Area, California. Students and recent graduates learn from the best at companies like Arcadis, Atomwise, Chrysalix, Dupont, Ligand Pharmaceuticals, Parsley Software, Roose Lab (UCSF), Segmed, Tellus, Zymergen and more. You will receive full support and assistance from Internships in the Valley and the Consulate General of the Netherlands in San Francisco, so you can focus comfortably on fulfilling your ambitions. A guaranteed kick-start to your career! Apply before 20 December.

INTERNSHIPSINTHEVALLEY.NL

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Agenda

Thursday 21 November to
5 December

SHOWING AT MOVIE W

Working Woman: Israeli drama about a talented woman whose career is at risk when her pushy boss makes unwanted sexual advances. *Manta Ray*: Poetic Thai film about friendship and Rohingya refugees. *Nuestro Tiempo*: Mexican drama about an open marriage. *Before the Frost*: Danish drama about a poor farmer who marries off his daughter. *Mjolk*: Icelandic tragic-comedy about a battle between farmers and the milk mafia. *Instinct*: Intriguing Dutch drama about a psychiatrist who falls in love with a criminal patient. Venue: Wilhelminaweg 3A, Wageningen. €6.50/€5.

MOVIE-W.NL

Saturday 23 November, 14:00–16:00
SPEED-DATING WITH AN ENERGY ADVISER

If you are trying to make your home more sustainable but could do with some more help, you can now benefit from speed-dating with an independent energy adviser, free of charge and with no obligations, in the bblthk. The 'date' lasts 20 minutes and gives you the chance to ask questions about your home. Some examples: My boiler needs replacing; what would be wise? I want to insulate my roof; what do I need to pay attention to? I want to invest in making my home more energy efficient; how do I make a good plan? You can just drop in, but to be sure of a 'date' you can book an appointment through the Energieloket (Robert-Jan): call 06-2435 0283 or email vraag@energieloket-wageningen.nl. Venue: bblthk, Stationsstraat 2.

Sunday 24 November, 16:00
MOVIE W DOCUMENTARY (IN ENGLISH) MISSION WOLF: EXPERIMENT IN LIVING

It's the story of rescued wolves on wild lands in Colorado and the volunteers who keep them alive. The stunningly beautiful hills near the Sangre Cristo mountains are the home of a wolf refuge called 'Mission: Wolf'. It is an odd place: off the grid, snowed in in winter, run by an often-changing group of young people who

strive to have a small footprint on the planet and to nurture themselves as they nurture the wolves. As Will, one of the volunteers, says, 'You can be healed in whatever way you need to be.' However, it's not always easy. The film will appeal to everyone interested in how wilderness impacts on people and people impact on wilderness. It's also deeply about wolves, what's left of wilderness in the West, and how an experiment in living impacts on any of us who strive to leave mainstream urban life behind. The film is introduced by special guest Aster Wijsman, who was on location. Q&A/discussion after the screening. Tickets for this unique event: €5.

MOVIE-W.NL

Tuesday 3 December, 17:30-19:30
WAGENINGEN DATA SCIENCE MEET-UP: 'CAN YOU USE MY DATA?'

Campus Connect and Wageningen Data Competence Center (WDCC) are organizing this fourth meet-up about

who can use our data, and why and when would or should you share data. Different opinions are presented by Jacqueline Ringersma (WUR), Petra Vossenbergh (FrieslandCampina), Fenny van Egmond (ISRIC) and Jos Tholen (JoinData). From open data sharing in the Geo-domain to safe but transparent data sharing in the food and agri-sector. And we will present WUR's ideas about data sharing. We'll start off with drinks and a small meal. Venue: Impulse, Speaker's corner. Register on the website.

WUR.EU/CAN-YOU-USE-MY-DATA

Thursday 5 December – 9 December
WAGGERS COMEDY FESTIVAL 2019
Wageningen's first ever Comedy Festival! Five days of all types of comedy, from improv and stand-up to musical. You can even dabble in the art-form and join a workshop in stand-up or improv comedy. Check out our agenda and get a Festival Pass (€28+€1 service fee) on the website. EEHPRODUCTIONS.COM/WAGGERS2019

Science Cafe Wageningen
www.sciencecafe.wageningen.nl
Music by: Sun Inside

**Old Masters
New Technologies**

Thursday, Nov. 21st
Café Loburg
19:45 Live music
20:15 Science
FREE ENTRANCE

Speakers:
Dr. Joen Hermans (Rijksmuseum)
Dr. Willemijn Elkhuizen (TU Delft)

Partners:
KLV
WAGENINGEN UNIVERSITY & RESEARCH
RESOURCE

Colophon

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Marc Lamers, Corporate Communications & Marketing, Wageningen University & Research



>>TYPICAL DUTCH



ILLUSTRATION: HENK VAN RUITENBEEK

On first-name terms

It was shortly after I started my Master's at WUR that I had to write an email to one of my professors for the first time. I wrote the way I would back in my home country, starting with 'Dear Mr/Mrs', keeping to a formal tone, and ending with 'Sincerely'.

Imagine the culture shock I experienced when my professor used my first name in her greeting, wrote in what to me was a *very* informal tone, and signed off using her first name! As I'd been brought up in a society that places great importance on social ranks and formalities, I was *not* used to professors treating me as an equal, in correspondence even less than in 'real life' situations.

Almost three years passed since this first encounter with the way Dutch people do 'formal'. By now, I start all my emails using a person's first name, and I also sign them with only my name. I have started to love the informality of Dutch correspondence and the informality of the society overall. Not having to use all their titles and names, but instead expressing your respect for someone directly by the way you act towards them, feels a lot less restrictive.

Using emojis in emails to my supervisor because my experiment went well? You bet! Being completely unfazed when our lab assistant replies to my email at 23:00, 'sent from my iPhone'-style? Yep! I am quite sure Dutch informality has made it impossible for me to ever have a panic attack over writing a formal email again. 📧 **Kristina Ledl, an MSc student of Biotechnology, from Slovenia**

'Thanks to Dutch informality I'll never panic about writing a formal email again'

Do you have a nice anecdote about your experience of going Dutch? Send it in! Describe an encounter with Dutch culture in detail and comment on it briefly. 300 words max. Send it to resource@wur.nl and earn 25 euros and Dutch candy.