EHzürich



WFSC Newsletter Issue 7 | August 2017

World Food System Center News

WFSC News

 $\ensuremath{\textbf{Prof.}}$ Michael Siegrist will become Chair of the WFSC as

of September. Voting by the WFSC Steering Committee took place in April. We thank outgoing Chair Prof. Nina Buchmann for her years of excellent service at the Center, and we wish her all the best in her new appointment as Department Head of D-USYS.



New Executive Director

Dr. Martijn Sonnevelt will start as the new Executive Director of the WFSC in November. We welcome Martijn to the Center and look forward to working with him! Please see the **Executive Office page** on the Center website for further information about our team.

The WFSC executive office has moved!

As of March, the WFSC executive office is located in the STE building, next door to the building housing the Disney Research Labs. Feel free to come by and visit! Find directions on our webpage: www.worldfoodsystem.ethz. ch/the-center/how-to-find-us

Check out our website For updated news and event listings from the Center, click on www.worldfoodsystem.ethz.ch.

Follow us on Twitter We are now active on Twitter, sharing updates on food system news, events, and member research! Follow us @ethzWFSC.



New Executive Director Profile

Dr. Martijn Sonnevelt is currently the Deputy Head of International Affairs, Research and Innovation at the Swiss Federal Office for Agriculture. Prior to this, he was leading a program at the United Nations Food and Agricultural Organization on ecosystem services and agriculture.



Martijn completed his bachelor, masters, and doctoral studies at ETH Zurich in Agricultural Economics. His doctoral thesis focused on understanding the actions and driving forces of smallholder farm households through an economic case study in the Sri Lankan hill country. He then worked as a Postdoctoral Researcher and Project Manager on the global grain value chains project that was supported through a donation from Bühler and included an expert advisory group from industry and government. He is currently faculty at ETH Zurich D-USYS, where he teaches in the MS level course "Food Security – From the Global to the Local Dimension" and in the BS level course "World Food System."



Research

1.6 million CHF awarded through the World Food System Grants Platform

We are pleased to announce five new cross-disciplinary, food system research projects funded through the Center's WFS Grants Platform. The two research programs on this platform, the Mercator Research Program and the Coop Research Program, provide support for these projects totaling more than 1.6 million CHF. The five new projects tackle pressing issues such as improving food production and safety and assessing food system resilience. Investigators at ETH Zurich as well as partners in Africa, North and South America, and Europe will focus their new work on a range of foodstuffs, including chicken, algae, beans, maize, cacao, and bananas.

Further information about ongoing postdoctoral and doctoral projects funded through the WFS Grants Platform can be found at www.worldfoodsystem.ethz.ch/research. Our call for new proposals is open until 01 November.

WFS Projects in the News

ZOMM: New publication in *Science of the Total Environment* investigates methods to increase the amount of zinc in wheat grains.

BioControl: Featured in *Coop Magazine* with an interview with postdoctoral fellow Dr. Anna Greppi highlighting her research on using reuterin as an effective alternative to chemical spoilage inhibitors.



AERTCvc: Report released from stakeholder workshop held in Ethiopia on the tef value chain, identifying key effects of drought and heavy rainfall events.

IMPROBUCK: Project profiled in *Coop Magazine* with Principal Investigator Prof. Achim Walter commenting how public interest in buckwheat and agrobiodiversity has grown during the project.



HERC: A new publication in *Agronomy* adds to knowledge required to develop a high-energy clover variety for sustainable ruminant livestock production.



For more news, check out our news feed: www.worldfoodsystem. ethz.ch/news

Flagship Project: Enhancing Resilience in Food Systems

The WFSC flagship project on food system resilience recently published the final report on its project on the resilience of the palm oil value chain in Sabah, Malaysia. In collaboration with The Forest Trust and the University of Malaysia in Sabah, developed resilience guidelines were applied to reveal the resilience of value chain actors against drought and heavy rainfall events. As part of the Coop WFS Grants project **AERTCvc**, a tef value chain stakeholder workshop was held in Debre Zeit, Ethiopia in March 2017, in joint collaboration with the Ethiopian Institute of Agricultural Research (EIAR) and the Kwame Nkrumah University of Science and Technology. Subsequently, a survey assessing the resilience of tef value chain actors was conducted with assistance from staff members from the EIAR. Further, as part of the work with the Swiss Federal Office of Agriculture (BLW) and FAO, a stakeholder workshop took place in May 2017 at ETH Zurich. A consortium of over 50 food systems practitioners discussed strategies to trigger innovations for building resilience in food systems.



Participants at the Innovations for Building Resilience in Food Systems Workshop in March 2017 at ETH Zurich.

Lastly, the BLW project on the Swiss food system has made significant progress. A total of 99 stakeholders participated in workshops for each value chain (milk, beef, wheat, wine, and potato), setting the groundwork for a survey later this year. Learn more about this flagship project at www. resilientfoodsystems.ethz.ch.

Flagship Project: Novel Proteins for Food and Feed

The WFSC Flagship project focusing on the topic of novel uses of alternative proteins for feed and food has gotten underway with Prof. Alexander Mathys signing on as the Principal Investigator, in collaboration with nine different WFSC member groups. Six projects will be underway this year, and efforts continue to secure funding to build the initiative. Focusing on the use of black soldier fly (BSF) larvae (*Hermetia illucens*) to convert organic waste into a component for animal feed production, the Engineering for Development (E4D) doctoral project of Moritz Gold is already underway. The project's first stakeholder workshop "Animal Feed Production from Biowastes: A roadmap for research on insect based feed" will be held in Stellenbosch, South Africa in September.



Prof. Alexander Mathys leads tour of Sustainable Food Processing Lab for collaborators at E4D Kick-off Meeting in July.

The flagship project was introduced to public audiences at the ETH Alumni Focus event "Algae and Insects-Protein sources of the future?" in April and at the ETH Agri-Food Alumni meeting in June. Prof. Mathys and collaborators from Wageningen University and EnerGaia also succeeded in establishing the new symposium "Addressing the Global Food Challenge with Algae" at the American Association for the Advancement of Science (AAAS) Annual Meeting in February 2018.

ETH Studio AgroFood: Digitalization in the AgroFood Sector

After a first step of stakeholder interviews to understand the needs, challenges, and opportunities of digitalization in the AgroFood sector in Switzerland, the workshop "Challenges of Digitalization in the AgroFood Sector" was held in May at ETH Zurich. The event, organized in collaboration with Swiss Food Research, provided different Swiss initiatives the opportunity to present and discuss their vision on digitalization in Switzerland and to connect with other stakeholders working on shared interests across the food value chain. We would like to thank all the participants of the event and look forward to the many opportunities and challenges ahead on this dynamic topic.

Also, project Manager Eduardo Pérez co-led a group of ETH Bachelor students on an excursion to visit the startups of Ecorobotix and Gamaya in March. Each startup demonstrated their innovative technologies, allowing students to see practical digital technologies in action and discourse with the entrepreneurs. Eduardo also introduced the potential of digitalization in the AgroFood sector at the ETH Agri-Food Alumni meeting in June. Learn more about this flagship project at www.worldfoodsystem.ethz.ch/ research/flagship-projects/eth-studio-agrofood.

Outreach

Public lecture by Prof. Wolfram Schlenker

The Center held a **public lecture** focused on the effects of weather shocks over food producing regions with keynote speaker Prof. Wolfram Schlenker, Columbia University. The European Union has seen an unprecedented wave of immigration since 2015. Prof. Schlenker and his colleagues investigated the role of weather shocks in global distressdriven migration to the European Union. Their findings were presented by Prof. Schlenker in July at ETH Zurich. The lecture was followed by a discussion moderated by Prof. Robert Finger.

Eating tomorrow at St. Gallen Nature Museum

WFSC Project Manager Dr. Anna Katarina Gilgen was invited as a keynote speaker at the St. Gallen Nature Museum in the framework of Helvetas' special exhibition «We Eat the World» in July. In her presentation "Eating Tomorrow: -Forschung für ein nachhaltiges Ernährungssystem," Anna focused on presenting the work of the Center and how we



WFSC Dr. Anna Katarina Gilgen at Helvetas' special exhibition «We Eat the World.»

use a systems approach to frame the research activities that we support. Our main research initiatives, the WFS Grants Platform and Flagship projects, then took center stage. The engaged public audience of about 40 people then had the opportunity to pose questions and discuss with Anna.

Screening of Food Evolution documentary

The WFSC hosted a **public screening** of Food Evolution, a new documentary exploring the controversy surrounding GMOs and food. The event in July filled the Semper Aula at ETH Zurich, with nearly 100 people in attendance. The film was followed by a panel discussion featuring ETH Prof. Wilhelm Gruissem (Plant Biotechnology), ETH Prof. Susanne Ulbrich (Animal Physiology), and Dr. Markus Hardegger (Head of BLW Genetic Resources and Technologies Unit). Devang Mehta, a doctoral student in the Plant Biotechnology group of Prof. Gruissem, organized the event and moderated the panel discussion.

Agora Project: Forschung zum Aufessen / Edible Research

The Agora project for school children age 12 to 15 is picking up speed. A first workshop with teachers from Zurich occurred in March, where the project was presented and valuable feedback gathered for planning of further activities. A first Bachelor thesis in the framework of "Edible Research" is almost finished; Manuel Stamm has adapted the palm oil game, a role play to understand stakeholder decisions in the palm oil value chain that was developed in the Forest Management & Development Group, for secondary school students. Thanks to contacts established in the teacher's workshop, Manuel was able to test the game with five school classes. A second Bachelor student, WFSC Alumna Luna Urio, is currently looking into the learning behavior of the children.



Young students during the palm oil role play at Pro Juventute «Ferienplausch» summer camp.

The greenhouse is now fully equipped for the planned activities, perfectly in time for the first two Pro Juventute "Ferienplausch" summer camp programs this July and August. In three-day workshops, young students learn about crop production systems, value chains, and sustainability indicators. Later this year, Edible Research presented at the ETH/UZH Scientifica and in visits to local schools.

Delivering Food Security on Limited Land (DEVIL)

The Belmont Forum Collaborate Research Action on Food Security and Land Use Change continues to drive research and outreach. An interactive Food Matters report highlights the crucial role that small and medium farms play in ensuring sustainable and nutritional food production, a key finding from the study "Farming and the geography of nutrient production for human use: a transdisciplinary analysis" in *The Lancet Planetary Health*. For more news from the DEVIL project, check out deliveringfoodsecurity.org.

Food System Stories

The blog launched in April 2016 and continues to produce interesting stories about projects and educational activities by the WFSC alumni network and researchers from WFSC member groups. A recent post took readers deep into the mountains in Nepal, where Fernando Casillas Bernal chronicles his meeting of small-scale organic farmers. We invite you to read the stories and follow the blog at www. foodsystemstories.org.



Food System Stories: Fernando with organic farmers in Nepal.

ETH Zukunftsblog

Under the topic of world food systems, many of our members post regular contributions to this blog hosted by ETH Corporate Communications. Read the recent features on digitilization in the agro-food sector, buckwheat, and biological diversity. Follow the blog at www.ethz.ch/en/ news-and-events/eth-news/zukunftsblog.html.

Education

WFS Summer School "Food Systems in Transition"

How do we make change happen in the food system? This was a key question at our summer school this July in Stellenbosch, South Africa. 25 students and young professionals from 17 different countries explored food systems in transition during two exciting weeks of discovery and innovation hosted at the Sustainability Institute in Lynedoch Ecovillage, near Stellenbosch, South Africa. The summer school was a part of the research project Delivering Food Security on Limited Land (DEVIL). WFSC Executive Director Michelle Grant and Education Manager Jonna Cohen led the group of 40 contributors that held sessions looking at the food system from various angles. The use of a combination of didactic tools, including lectures, workshops, panels, facilitated discussions, field trips, case studies, role-plays, creative work, group work, and community work, was used to empower the students to create appropriate solutions to global challenges. Thanks again to all our contributors, and we wish our alumni the best of luck as they continue on their journey working in the food system!

Testimonials from 2017 WFS Summer School in Stellenbosch, South Africa.

The WFSC summer school was one of the most diverse and vibrant group of people that I have ever worked alongside. Good food, good people!



The course provided a profound insight into understanding the different players in a complex food system.

This was an incredibly well-directed course with very relevant content, set within a rich learning environment. It makes for a very stimulating learning and growing experience.

The course is a great example of how to deliver complex and often interlinked concepts in the world food system in an engaging and participatory manner.

The discussion and exchange of ideas with the other participants helped me to realize that [even if] we cannot solve the complex problems of the world, starting small and being enthusiastic about solutions is key.

Find out more about the summer school: http://www.worldfoodsystem. ethz.ch/news/wfsc-news/2017/07/summer-school-2017.html

Also visit **#WFSSummer** to see updates on our WFS Summer School program!



Students visiting the largest food retailer in Africa at WFS summer school.

Future Summer Schools - Côte d'Ivoire

Our next summer school occurs in January 2018 in Côte d'Ivoire. The two-week intensive academic course entitled "Food Systems in Transition" will take place in Abidjan, Bouaké, and a number of field sites. The program takes an integrated approach that considers interactions across the food system, with its environmental, social, political, and economic boundary conditions. This course is being hosted in collaboration with the Centre Suisse de Recherches Scientifiques en Côte d'Ivoire (CSRS), a lead member institution in the Swiss National Science Foundation Research for Development «Yamsys» project. More details about the program available at www.worldfoodsystem.ethz. ch/education/summer-schools.

Sustainable Campus Catering

The ETH Catering Commission launched a project in 2013 to find ways that catering companies could contribute to ETH climate goals and to determine the critical factors influencing sustainable catering. ETH Seed Sustainability and the WFSC came onboard to lead the project, which was largely based on research done in the context of Master thesis work in the "living lab" of the ETH canteens. The final report of the project is now available, a joint publication of ETH Seed Sustainability (lead: Patrick Jiranek) and the WFSC (lead: Bastian Flury). In addition to the results from the students' projects, the report takes further steps to introduce a Climate Program at ETH Zurich, with the goal of catering companies to reduce greenhouse gas emission by 10% in the next three years. Furthermore, the report provides recommendations on how sustainability managers at universities can reduce greenhouse gas emissions together with multiple catering partners. These recommendations recently attracted great attention at the 2017 Conference of the International Sustainable Campus Network (ISCN) in Vancouver. See more details on the project website.

Food Security and Resilience Food Systems at FAO

In April, the WFSC collaborated with the Sustainable Agroecosystems Group and the Food and Agriculture Organization of the United Nations (FAO) to offer a threeday course for ETH Zurich Master's students at the FAO headquarters in Rome. This was the sixth time the course was offered, after being initiated in 2010. This year, the course was designed and taught by the Sustainable Agroecosystems Chair and focused on the topic of diversity in food systems. In particular it looked at the dual role of diversity in promoting resilient agro-ecosystems and in supporting dietary diversity. An engaged group of ETH Zurich students participated in a range of presentations and discussions with experts from the FAO and from Bioversity International and worked on their own case study. They also had the chance to interact extensively with the Permanent Representation to Switzerland for the Rome Based Agencies (FAO, WFP, IFAD) to understand the contribution and role of Switzerland in food and nutrition processes at the international level.



WFSC Executive Director Michelle Grant with students at FAO in Rome.

Member Highlights

Prof. Nina Buchmann featured in EU Grants Access Science Stories. The multifaceted research challenges and numerous international collaborations of the group are highlighted.

Prof. Alexander Mathys research group highlighted in several media outlets this spring, including ETH *Polykum* magazine, 3sat science program *nano*, and the SRF1 panel discussion program *Der Club*.

A new documentary "Inventing the Future in Zurich" shows how ETH is tackling some of the world's most pressing problems, and how several of our WFSC members are working across complex fields to create a sustainable future. The work of **Profs. Raffaele Mezzenga, Sonia Seneviratne, Alfredo Brillembourg, and Hubert Klumpner** is featured. Watch the full length program at https://www.ethz.ch/en/ the-eth-zurich/portrait/dokumentarfilm.

Yifan Zhang and Lukas Böcker, doctoral students in the Sustainable Food Processing group of Prof. Alexander Mathys, received IFT17 student awards in the Nonthermal and International divisions. Yifan sucessfully defended her poster entitled "Isolation and characterization of high pressure superdormant spores." Lukas also defended his poster entitled "Biphasic short time heat degradation of the functional algae protein phycocyanin." The WFSC congratulates Yifan and Lukas on their achievement!

Recent Food System Publications

Below is a selection of recent publications from WFSC members that highlight their work on food system topics.

Aganovic, K.; Smetana, S.; Grauwet, T.; Toepfl, S.; Mathys, A.; Van Loey, A.; Heinz, V. Pilot scale thermal and alternative pasteurization of tomato and watermelon juice: An energy comparison and life cycle assessment. *J. Clean. Prod.* **2017**, 141, 514–525. doi: 10.1016/j.jclepro.2016.09.015

Andres, C.; Gattinger, A.; Dzahini-Obiatey, H. K.; Blaser, W. J.; Offei, S. K.; Six, J. Combatting Cocoa Swollen Shoot Virus Disease: What do we know? *Crop Prot.* **2017**, 98, 76–84. doi: 10.1016/j.cropro.2017.03.010

Berry, T. M.; Fadiji, T. S.; Defraeye, T.; Opara, U. L. The role of horticultural carton vent hole design on cooling efficiency and compression strength: A multi-parameter approach. *Postharvest Biol. Technol.* **2017**, 124, 62–74. doi: 10.1016/j. postharvbio.2016.10.005

Born, Y.; Fieseler, L.; Thöny, V.; Leimer, N.; Duffy, B.; Loessner, M. J. Engineering of bacteriophages Y2::dpoL1-C and Y2::luxAB for efficient control and rapid detection of the fire blight pathogen, *Erwinia amylovora. Appl. Environ. Microbiol.* **2017**, 83 (12), e00341-17. doi: 10.1128/AEM.00341-17

Clara, R.; Schumacher, M.; Ramachandran, D.; Fedele, S.; Krieger, J.-P.; Langhans, W.; Mansouri, A. Metabolic adaptation of the small intestine to short- and medium-term high-fat diet exposure. *J. Cell. Physiol.* **2017**, 232 (1), 167–175. doi: 10.1002/jcp.25402

Denyes, J. M.; Dunne, M.; Steiner, S.; Mittelviefhaus, M.; Weiss, A.; Schmidt, H.; Klumpp, J.; Loessner, M. J. Modified bacteriophage S16 long tail fiber proteins for rapid and specific immobilization and detection of *Salmonella* cells. *Appl. Environ. Microbiol.* **2017**, 83 (12), e00277-17. doi: 10.1128/AEM.00277-17

Finger, R.; Listorti, G.; Tonini, A. The Swiss payment for milk processed into cheese: ex post and ex ante analysis. *Agr. Econ.* **2017**, 48 (4), 437–448. doi: 10.1111/agec.12345

Grüter, R.; Costerousse, B.; Bertoni, A.; Mayer, J.; Thonar, C.; Frossard, E.; Schulin, R.; Tandy, S. Green manure and long-term fertilization effects on soil zinc and cadmium availability and uptake by wheat (*Triticum aestivum* L.) at different growth stages. *Sci. Total Environ.* **2017**, 599, 1330–1343. doi: 10.1016/j.scitotenv.2017.05.070

Jans, C.; Merz, A.; Johler, S.; Younan, M.; Tanner, S. A.; Kaindi, D. W. M.; Wangoh, J.; Bonfoh, B.; Meile, L.; Tasara, T. East and West African milk products are reservoirs for human and livestock-associated *Staphylococcus aureus*. *Food Microbiol.* **2017**, 65, 64–73. doi: 10.1016/j.fm.2017.01.017

Kirchgessner, N.; Liebisch, F.; Yu, K.; Pfeifer, J.; Friedli, M.; Hund, A.; Walter, A. The ETH field phenotyping platform FIP: A cable-suspended multi-sensor system. *Funct. Plant Biol.* **2017,** 44 (1), 154–168. doi: 10.1071/FP16165

Langhans, W. Food components in health promotion and disease prevention. *J. Agric. Food Chem.* **2017**. doi: 10.1021/acs.jafc.7b02121

Lorenz, B. A.; Hartmann, M.; Hirsch, S.; Kanz, O.; Langen, N. Determinants of plate leftovers in one German catering company. *Sustainability* **2017**, 9 (5), 807. doi: 10.3390/su9050807

Munz, N. A.; Burdon, F. J.; de Zwart, D.; Junghans, M.; Melo, L.; Reyes, M.; Schönenberger, U.; Singer, H. P.; Spycher, B.; Hollender, J.; et al. Pesticides drive risk of micropollutants in wastewater-impacted streams during low flow conditions. *Water Res.* **2017**, 110, 366–377. doi: **10.1016/j.watres.2016.11.001**

Huber, R.; Snell, R.; Monin, F.; Brunner, S. H.; Schmatz, D.; Finger, R. Interaction effects of targeted agri-environmental payments on non-marketed goods and services under climate change in a mountain region. *Land Use Policy* **2017**, 66, 49–60. doi: 10.1016/j.landusepol.2017.04.029

UPCOMING EVENTS

Workshop: New Cold-chain and Packaging Technologies to Reduce Food Losses (28 August 2017) This workshop offers a platform to bring together experts from academics and industry that work on cold-chain and packaging technology for foods.

Scientifica (01-03 Septermber 2017) Scientifica occurs every two years at the ETH Zurich and University of Zurich at the end of the summer. The Center will have an interactive exhibit «Nachhaltige Ernährung mit Bits und Bytes» focusing on the effects of the influx of data from information and communication technology on agriculture. www.scientifica.ch

Workshop: Animal Feed Production from Biowastes: A roadmap for research on insect based feed (07 September 2017) The workshop will present state of the art of research on processing of biowastes with the black solider fly larvae (*Hermetia illucens*) into animal protein and will explore the research priorities moving forward.

Fall Public Lecture: Tackling Malnutrition with Biofortification: Challenges and Opportunities (12 September 2017) Our next public lecture will feature a keynote lecture by Dr. Maria Andrade from the International Potato Center, winner of the 2016 World Food Prize for her part in the development of the biofortified orange-fleshed sweet potato.

OLMA Swiss Fair of Agriculture and Nutrition (12-22 October 2017) The Center will participate in the special exhibit organized by PubliFarm, an outreach program focused on sustainability, research, and public discourse. www.publifarm.ch

Annual Symposium (25 October 2017) Our public research symposium highlights the research that the WFS Grants programs support as well other food system relevant research conducted by our members and their groups at ETH Zurich, Agroscope, and Eawag. Come join this public event to learn more about food systems research and network with others!

WFS Summer School (27 January - 10 February 2018) The 2018 course on "Food Systems in Transition" will take place in Côte d'Ivoire.

www.worldfoodsystem.ethz.ch/outreach-and-events/ upcoming-events.html

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Willersinn, C.; Mouron, P.; Mack, G.; Siegrist, M. Food loss reduction from an environmental, socio-economic and consumer perspective – The case of the Swiss potato market. *Waste Manag.* **2017**, 59, 451–464. doi: 10.1016/j. wasman.2016.10.007

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