



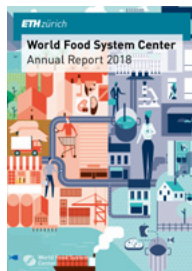
WFSC Newsletter Issue 11 | July 2019

World Food System Center News

Center News

Annual Report 2018

We published our 2018 Annual Report in April. It features highlights from the broad range of activities in research, education, and outreach that we plan, develop, and execute together with our over 40 members. [Download online](#)



New Executive Office Staff

This spring we welcomed Braida Thom as an intern with the Center. She recently completed her master studies in Agricultural Economics at ETH Zurich and Boku Vienna. Braida supports the team in various outreach and education activities. Please see the [Executive Office page](#) on the Center website to learn more about our team.

Connect!

Keep up to date on all Center news, events, member research, and more by following us @ethzWFSC on [Twitter](#) and [Facebook](#). We also share videos from the Center on our [YouTube channel](#).

All WFSC members, alumni, partners, and collaborators are invited to join our World Food System Center LinkedIn group, with the aim to connect students and professionals who are interested in working towards sustainable food systems: <https://www.linkedin.com/groups/12070987>.

Welcome to our New Members

We welcome Emma Wetter Slack, Thomas Van Boeckel, and Jan Dirk Wegner as new members. Prof. Wetter Slack leads the group of Food Immunology. The group focuses on understanding the underlying mechanisms controlling interactions among the immune system, microbiota, host- and microbial metabolism, and diet. They apply this knowledge to develop cost-effective mucosal vaccines, targeting common animal pathogens and pathobionts.



Prof. Thomas Van Boeckel heads the group of Health Geography and Policy. The group works at the interface of biology and policy to develop maps of antimicrobial resistance and explore economic incentives to reduce antimicrobial use in food production.

Dr. Jan Dirk Wegner leads the EcoVision Lab, which does research at the interface of machine learning, computer vision, and remote sensing to solve ecological questions.



Member Booklet 2019

Our member booklet is all new with loads of information about our 42 member groups. [Download online](#)



Future Food Initiative

In February, ETH Zurich and EPFL launched the Future Food Initiative in cooperation with their longstanding Swiss industry partners Bühler, Givaudan, and Nestlé. The initiative promotes innovative research approaches for sustainable food production, with the overarching goal to develop solutions that address grand challenges, including sustainable packaging and affordable nutrition. A select group of talented individuals will receive financial support made possible by CHF 4.1 million in donations from industry partners. The WSFC, along with the Integrative Food Science and Nutrition Center at EPFL, manages the initiative. Learn more at www.futurefoodtalents.org.

Flagship Project: Enhancing Resilience in Food Systems

The WFSC Flagship Project on food system resilience continues connecting stakeholders and developing practical tools. New projects include the Swiss Agency for Development and Cooperation project “The rural-urban nexus: Establishing a nutrient loop to improve city region food system resilience” (RUNRES), which recently produced an introductory video available on [YouTube](#).



RUNRES coordinator Prof. Johan Six, ETH Zurich Sustainable Agroecosystems, narrates the new project video.

Initial stakeholder mapping workshops in Bukavu, Democratic Republic of Congo and Kigali, Rwanda have already taken place. “The objective of the workshop was to define how and who will be involved in co-establishing safe, efficient, and socially acceptable innovations to close the nutrient loop and install a circular economy in the city region food systems,” explains Johan Six, professor of Sustainable Agroecosystems at ETH Zurich and RUNRES project coordinator. RUNRES is committed to actively involving stakeholders at all stages of the value chain in its transdisciplinary innovation platforms.

For many project reports and to learn more about this Flagship project, visit 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 continues to be highlighted in the media.

A recent ETH Podcast, featuring Principal Investigator Prof. Alexander Mathys and Dr. Christina Hartmann from the Consumer Behaviour Group, focused on the consumer and sustainability dimensions of introducing insects into European diets. [Listen to podcast online](#)

Greta Canelli, Lukas Böcker, Iris Haberkorn, and Alessia Delbrück from the Sustainable Food Processing (SFP) Group were invited to participate at World Minds in Belgrade in May 2019. This year’s symposium consisted of a workshop on solving wicked problems, as well as a day full of inspirational talks. The SFP participants enjoyed the opportunity to share their ideas and visions for a more sustainable food system with leaders from different fields.



Lukas Böcker, Iris Haberkorn, Greta Canelli, and Alessia Delbrück (l to r) from the Sustainable Food Processing Group at World Minds in Belgrade.

WFSC Research Programs

Three new cross-disciplinary postdoctoral research projects are awarded over 800,000 CHF in May 2019 through the World Food System Center Coop Research Program. In total, the Center’s two research programs have funded 33 cross-disciplinary and solution-oriented research projects with nearly 8.8 million CHF since 2012.

Updates about projects funded through the Center’s Research Programs can be found at www.worldfoodsystem.ethz.ch/research.

Agriculture of the Future – digital and sustainable?

At AgriTech Day on 25 May, the ETH-Research Station for Plant Sciences, Strickhof, and AgroVet-Strickhof opened their doors under the motto "Agriculture of the future - digital and sustainable?" At numerous attractions, demonstrations, and forums discussions, visitors discovered innovative tools to support more sustainable Swiss agriculture.

The WFSC along with the ETH Studio AgroFood and Crop Science Group collaborated with Strickhof and AgroVet-Strickhof to organize this innovative public event. Researchers from all the institutions came together to create numerous attractions allowing for discovery, exchange, and a bit of fun for all ages.

An open discussion about smart farming among producers and consumers alike is important to achieve its potential for production and breeding while considering also economics and environmental issues. Such topics were discussed in the forum, where researchers from ETH Zurich shed some light on the different perspectives and challenges of digitalization. The lecture series ended with a panel discussion about sustainable agriculture from the perspectives of research, education, politics, and practice.

An important aspect of the day was the exchange of ideas and perspectives among all involved. The public added their thoughts to the discussions in the forum throughout the day.

We thank all those participated for making this a truly outstanding public event. We hope all that attended had an informative and inspiring day! To learn more about the event, visit www.ethz.ch/agritech



The Crop Science Group presented the Field Phenotyping Platform (FIP) as it flew high above the fields at AgriTech Day.



Several robots, including ANYmal, Phenofly, and Husky, were at work during the "Field Hands of the Future" demonstrations at AgriTech Day.

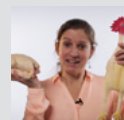


The "Visions of sustainable agriculture" panelists included Bernard Lehmann, Director of Swiss Federal Office for Agriculture; Rosmarie Fischer-von Weissenfluh, farmer; Martijn Sonneveld, WFSC; Ueli Voegeli, Director of Strickhof; and Achim Walter, ETH Zurich (l to r).

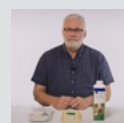
New Videos for WSFC Research Program Projects

We are pleased to share new videos highlighting results and relevance to stakeholders from several completed projects.

A few things you might not know about chickens: Assessing the potential of farming chickens that produce both eggs and meat (dual-purpose) and measuring consumer willingness to pay more. <https://youtu.be/rCexQZA73Jk>



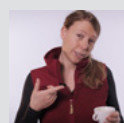
Fighting the other greenhouse gas: Tackling greenhouse gas emissions from livestock systems by looking at the effects of cow age on methane emissions. <https://youtu.be/Y0zXuCOCWU>



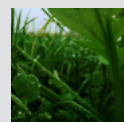
Towards solving the zinc crisis: Investigating management options to increase the zinc content of wheat grains. <https://youtu.be/RkxvzxucQ5g>



How to protect the environment (and drink better coffee): Measuring the potential of coffee agroforests to increase the sustainability of coffee production in India. <https://youtu.be/djud5Ve5RkM>



How to protect the soil: Highlighting different management options to conserve soil quality. <https://youtu.be/lcPnCs7ueIM>



More videos from the WSFC on our [World Food System Center YouTube Channel](#).

Pesticides - What Does Science Say?

In order to provide a platform for a science-based discussion and address questions relevant for a broad audience on the topic of pesticides in agriculture and the consequences on the environment and human health, we held a salon discussion at ETH Zurich on 03 April. Over 100 guests sent questions to our panel of experts and talked further with them and other invited scientists in open discussion.

Michelle Grant moderated the evening, which started with the introduction of the panel: Robert Finger, professor of Agricultural Economics and Policy at ETH Zurich, Dr. Lothar Aicher, a regulatory toxicologist at the Swiss Center for Applied Human Toxicology, and Philipp Staudacher, a doctoral student at Eawag.

Comments from the panelists were broad in range, from specific pesticide effects and how risk assessments are conducted to more system-based issues of how agricultural policy changes over time.

After the plenary session, all attending were encouraged to continue the discussion with the three panelists as well as with other invited researchers working on issues related to pesticide use in food systems. With a drink and a snack, the audience engaged in a lively discussion and learned more about different perspectives and trade-offs.

We thank all the invited scientists for coming to share their views with the audience and to all for contributing to the open discussion.



Michelle Grant asked the audience at the event why they choose to eat a certain apple. What led to that decision?

ArtSci: Blurring the Borders

A team of ETH students from the Department of Environmental System Sciences curated an ArtSci exhibit at ETH Zurich from 29 April to 10 May. Three researchers from the WFSC flagship project Enhancing Resilience in Food Systems created a unique visual and audio piece for the exhibit. Braida Thom, Kenza Benabderrazik, and Luzian Messmer drew from their field experience in Morocco, Ghana, and Ethiopia to create "Science goes beyond numbers." At the Finissage of the event, Michelle Grant participated in the ArtSci panel to discuss her experience of mixing art and science in WFSC educational offerings and her other professional endeavors. We congratulate the ArtSci team for a fun, insightful exhibit as well as Braida, Kenza, and Luzian for their prize.



"Science goes beyond numbers" won one of the special prizes of the ArtSci exhibit.

Edible Research

The SNF Agora project Edible Research has had another success. In the framework of the program, Manuel Stamm adapted a role-playing game on palm oil for educational purposes. He recently won third place of the German Simulation Game Award for his ETH Zurich bachelor thesis project based on the game development. Several game boxes are now available at teacher training universities, and the game continues to be played in schools.

Helvetas Webinar

On 16 May, Helvetas Switzerland hosted the webinar "[Coherent policies driving sustainable food systems in Switzerland and India.](#)" Frank Eyhorn (Helvetas) and WFSC member Adrian Müller were joined by Bernard Lehmann (Swiss Federal Office for Agriculture) and Neeraja Adidam (Ministry of Agriculture & Farmers Welfare, India). Our Martijn Sonneveld moderated the discussion.

Assam Agricultural University

Over ten days in June 2019, the WFSC hosted twenty bachelor students from Assam Agricultural University in Assam, India for an Exchange and Learning Visit. During the exchange, the students explored challenges in the food system, specifically focusing on differences between the Indian and Swiss agricultural systems. Classroom sessions featured topics such as complex systems and policy perspectives, while field visits allowed deeper learning of organic farming systems, smart farming technologies, and aquaponics. Contributor presentations introduced innovative ideas from start-ups, industry, and research.

We thank all the contributors for their presentations and open discussions with the students. They found the exchange truly inspiring, with many commenting on their better understanding of challenges, solutions, and trade-offs in complex systems; gaining new ideas for their future; learning about the potential of organic agriculture; and growing in personal confidence.



Students from Assam Agricultural University visiting the Swiss Alps.

FAO Course: Food Security

Since 2014, the WFSC has collaborated with the Food and Agriculture Organization of the United Nations (FAO) and the Sustainable Agroecosystems Group to offer a three-day course for ETH Zurich Master's students at the FAO headquarters in Rome. This year, the course in April focused on [Food Security - from the Global to the Local Dimension](#). The students also joined in the "Agroecology as a means to achieve the Sustainable Development Goals" event, where WFSC Education Director Michelle Grant, in her function as member of the Swiss FAO National Committee (CNS FAO), presented recommendations in a keynote.

Food System Stories

This creative blog space of the WFSC alumni community offers a platform to share stories. Follow the blog at www.foodsystemstories.org/

Prof. Emmanuel Frossard, Dr. Christian Stamm, and Dr. Astrid Oberson

are among the organizers of the International Phosphorus Workshop [Putting Phosphorus first? How to address current and future challenges](#), which was held in July. Over 200 experts discussed the possibilities of recycling phosphorus from wastewater, liquid manure, and refuse.

Prof. Achim Walter and Prof. Christian Schöb featured in *Sonntags Blick* article "[Six ideas for an agricultural revolution](#)" in June.

The Agricultural Economics and Policy Group of **Prof. Robert Finger** is organizing with Agroscope the [171st Seminar of the European Association of Agricultural Economists](#) "Measuring and evaluating farm income and well-being of farm families in Europe" in September.

Prof. Emmanuel Frossard honored as Visiting Professor at the Department of Crop Science, Faculty of Agriculture, University of Peradeniya in Sri Lanka in May.

Interview with **Prof. Nina Buchmann** in *Schweizer Familie* in February entitled "[Nobody can rescue the world all alone.](#)"

Dr. Thijs Defraeye presented his sculpture "The fruit spy who came in from the cold" at the ETH Zurich ArtSci exhibition in May, winning one of the special prizes of the exhibit.

Dr. Jan Dirk Wegner received research funding for the project "Deep learning and time-series of satellite images for sustainable crop production in the tropics."

Yifan Zhang of the group of Prof. Alexander Mathys received the International Association for Food Protection Student Travel Award in April.

As a follow-up to **Prof. Nina Buchmann's** keynote address at the Anniversary Event "30 years Vontobel Award for Agricultural Sciences," [Vontobel](#) interviewed her in April on the current challenges facing agriculture.

The paper "Flood-water level estimation from social media images" from the group of **Dr. Jan Dirk Wegner** was awarded the best paper award at the semantics3D workshop of the ISPRS Geospatial week in June.

Many members regularly contribute to the ETH Zukunftsblog. Read the recent features on agricultural technology, a vision of a climate-neutral Switzerland, deforestation, and organic agriculture at www.ethz.ch/en/news-and-events/zukunftsblog.html.

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

Böcker, T.; Möhring, N.; Finger, R. Herbicide free agriculture? A bio-economic modelling application to Swiss wheat production. *Agric. Syst.* **2019**. <https://doi.org/10.1016/j.agsy.2019.03.001>

Caporgno, M.P.; Haberkorn, I.; Böcker, L.; Mathys, A. Cultivation of *Chlorella protothecoides* under different growth modes and its utilisation in oil/water emulsions. *Bioresource Technol.* **2019**. <https://doi.org/10.1016/j.biortech.2019.121476>

Chen, C.; Chaudhary, A.; Mathys, A. Dietary change scenarios and implications for environmental, nutrition, human health and economic dimensions of food sustainability. *Nutrients*. **2019**. <https://doi.org/10.3390/nu11040856>

Engbersen, N.; Gramlich, A.; Lopez, M. Cadmium accumulation and allocation in different cacao cultivars. *Sci. Tot. Environ.* **2019**. <https://doi.org/10.1016/j.scitotenv.2019.05.001>

Finger, R.; Swinton, S.; El Benni, N.; Walter, A. Precision farming at the nexus of agricultural production and the environment. *Annu. Rev. Resour. Econ.* **2019**. <https://doi.org/10.1146/annurev-resource-100518-093929>

Grêt-Regamey, A.; Huber, S. H.; Huber, R. Actors' diversity and the resilience of social-ecological systems to global change. *Nature Sustain.* **2019**. <https://doi.org/10.1038/s41893-019-0236-z>

Grüter, R.; Costerousse, B.; Mayer, J.; et al. Long-term organic matter application reduces cadmium but not zinc concentrations in wheat. *Sci. Tot. Environ.* **2019**. <https://doi.org/10.1016/j.scitotenv.2019.03.112>

Kälin, U.; Lang, N.; Hug, C.; et al. Defoliation estimation of forest trees from ground-level images. *Remote Sens. Environ.* **2019**. <https://doi.org/10.1101/441733>

Lemming, C.; Oberson, A.; Magid, J.; et al. Residual phosphorus availability after long-term soil application of organic waste. *Agric. Ecosyst. Environ.* **2019**. <https://doi.org/10.1016/j.agee.2018.10.009>

Loaiza Puerta, V.; Pereira, E.P.; Huang, P.; et al. Soil microhabitats mediate microbial response in organic reduced tillage cropping. *Appl. Soil Ecol.* **2019**. <https://doi.org/10.1016/j.apsoil.2019.01.009>

Paganini, D.; Uyoga, M.A.; Kortman, G.A.M.; et al. Iron-containing micronutrient powders modify the effect of oral antibiotics on the infant gut microbiome and increase post-antibiotic diarrhoea risk. *Gut*. **2019**. <http://dx.doi.org/10.1136/gutjnl-2018-317399>

Proietti, M.; Perruzza, L.; Scribano, D.; et al. ATP released by intestinal bacteria limits the generation of protective IgA against enteropathogens. *Nature Comm.* **2019**. <https://doi.org/10.1038/s41467-018-08156-z>

Smetana, S.; Schmitt, E.; Mathys, A. Sustainable use of *Hermetia illucens* insect biomass for feed and food: Attributional and consequential life cycle assessment. *Resour. Conserv. Recy.* **2019**. <https://doi.org/10.1016/j.resconrec.2019.01.042>

Wiggenhauser, M.; Bigalke, M.; Imseng, M.; et al. Using isotopes to trace freshly applied cadmium through mineral phosphorus fertilization in soil-fertilizer-plant systems. *Sci. Tot. Environ.* **2019**. <https://doi.org/10.1016/j.scitotenv.2018.08.127>

Wilde, B.C.; Lieberherr, E.; Okem, A.E.; Six, J. Nitrified human urine as a sustainable and socially acceptable fertilizer: An analysis of consumer acceptance in Msunduzi, South Africa. *Sustainability*. **2019**. <https://doi.org/10.3390/su11092456>

Wille, L.; Messmer, M.; Studer, B.; Hohmann, P. Insights to plant-microbe interactions provide opportunities to improve resistance breeding against root diseases in grain legumes. *Plant Cell Environ.* **2019**. <https://doi.org/10.1111/pce.13214>

Yates, S.; Jaskine, K.; Liebisch, F.; et al. Phenotyping a dynamic trait: Leaf growth of perennial ryegrass under water limiting conditions. *Front. Plant Sci.* **2019**. <https://doi.org/10.3389/fpls.2019.00344>

UPCOMING EVENTS: <https://bit.ly/wfscevents>

WFS Summer School 2019 (17 August-01 September 2019) Our next course will take place in Rheinau, Switzerland, focusing on food systems in transition.

Scientifica: Zurich Science Days (31 August-01 September 2019) Our interactive exhibit "Food of the Future" showcases innovative solutions to feed the world, as part of this year's ETH/USZ Scientifica.

ETH Industry Day (04 September) An annual event highlighting research and entrepreneurial activities of ETH Zurich; we will exhibit innovative research from our projects and members groups at the event.

Implications of Digitalisation in Agriculture (04 September) A public event discussing the implications of digitalisation in agriculture for farmers, food systems, and policies with leading researchers.

OLMA Swiss Fair for Agriculture and Nutrition (10-20 October 2019) ETH Zurich will have an exhibit showcasing its research in the «Erlebnis Nahrung» (Experience Food) themed hall at OLMA in St. Gallen.

WFSC Research Symposium (31 October 2019) Our public research symposium highlights research from our programs as well other food system relevant research conducted by our member groups at ETH Zurich, Agroscope, Eawag, Empa, and FiBL.

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