ETH zürich


# World Food System Center

## Annual Report 2023

World Food System Center

# Dear Colleagues, Partners, Alumni, and Friends:

We are pleased to share with you our Annual Report 2023, which highlights our many research, education, and outreach activities focused on food system transformation.

For the vision of sustainable food systems to become a reality, existing structures, established practices, and cultural habits must be courageously changed. Applications of smart combinations of local knowledge and science-driven innovations in farming, industry, and policy are paramount. Furthermore, appropriate policy measures are needed to create incentives that promote awareness and willingness to adopt new behaviors in production and consumption.

At the World Food System Center, with its 46 members from different disciplines, we believe that we can only get closer to sustainable food systems if we strengthen the cooperation across the entire system. We try to support this process by establishing research programs with a wide range of partners. The aim is to incorporate the results of these programs into the decision-making processes of policy makers, practitioners, and industry. Overall, we at the World Food System Center align our activities in research, education, and outreach to reach these goals.

We are very pleased that in 2023 we were able, together with our partners, to start nine new projects in various fields using different tools, methods, and approaches. They all address key challenges in nutrition and sustainable agriculture. Over the next few years, these projects will produce results that we will discuss and further develop with various stakeholders. Our goal is to contribute to the translation of research results into reality.

We hope some activities highlighted in this report inspire you to engage with us in 2024.
Happy reading.

*Robert Finger*
*Chair*
*Professor of Agricultural Economics and Policy at ETH Zurich*

Robert Finger
Chair

Martijn Sonnevelt
Executive Director

*Martijn Sonnevelt*
*Executive Director*

Visitors at the 'Innovation on our plates' exhibit at Scientifica in September 2023.

# Year in Review

## Highlights from the Center's work in its three main activity areas of research, education, and outreach.

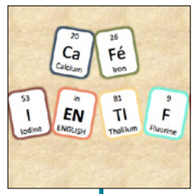
**Education**
Alumni Stories: Sustainable agriculture in Sicily

**Research**
Call for Future Food Fellowship projects


**Outreach**
Annual Report 2022
Celebrating 10+ Years of Collaboration Edition

**Research**
Call for Improving Sustainability of Agricultural and Food Systems Research Program

**Outreach**
Premiere of research film 'Dynamic Agroforestry for Sustainable Livelihoods' at Schoggi Festival in Zurich




**Outreach**
Robert Finger at Café Scientifique of Life Science Center Zurich

**Outreach**
Martijn Sonnevelt on SRF Club Summer Series 'Politics on the Plate'

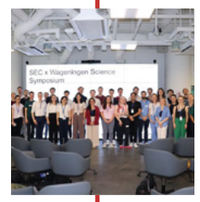
**Education**
Alumni Stories: Bloom – Planting seeds of change

**Outreach**
ETH/UZH Scientifica 'Innovation on our Plate' exhibit with Department of Environmental Systems Science

**Outreach**
'Switzerland an organic country? Vision or nutritional nightmare?' Discussion event at the Open Your Eyes Photo Festival


**Outreach**
Members' research at the Open Your Eyes Photo Festival in Zurich

**Outreach**
Food Day @ETH with afternoon workshops then plenary and networking poster sessions




**Research**
Urban Microalgae Protein Production Project at Singapore-ETH Centre at SEC x Wageningen Science Symposium

JANUARY | FEBRUARY | MARCH | APRIL | MAY | JUNE | JULY | AUGUST | SEPTEMBER | OCTOBER | NOVEMBER | DECEMBER

**Education & Outreach**
Public lecture series 'Agroecology and the Transition to Sustainable Food Systems'


**Research**
Call for Smart Sustainable Farming Research Program

**Outreach**
Martijn Sonnevelt keynote speaker at Greenbuzz event 'Future of Food – How to feed 8 billion sustainably?'


**Education**
Food Security and Resilient Food Systems course at FAO in Rome

**Education**
Alumni Stories: Role of agroecology in Colombia

**Outreach**
Martijn Sonnevelt at Spirit of Bern panel discussion: 'Producing more or differently? Food production for the planet'


**Outreach**
ETH Zurich 'Where the future begins – Research for sustainable agriculture' exhibit and Canton of Zurich 'Family Garden' exhibit at OLMA


**Outreach**
Workshop 'Field to Fork: AI on our plates' at AI+X Summit in Zurich


**Education**
ETH Zurich Youth Delegation at the Global Youth Forum of the World Food Forum at FAO in Rome

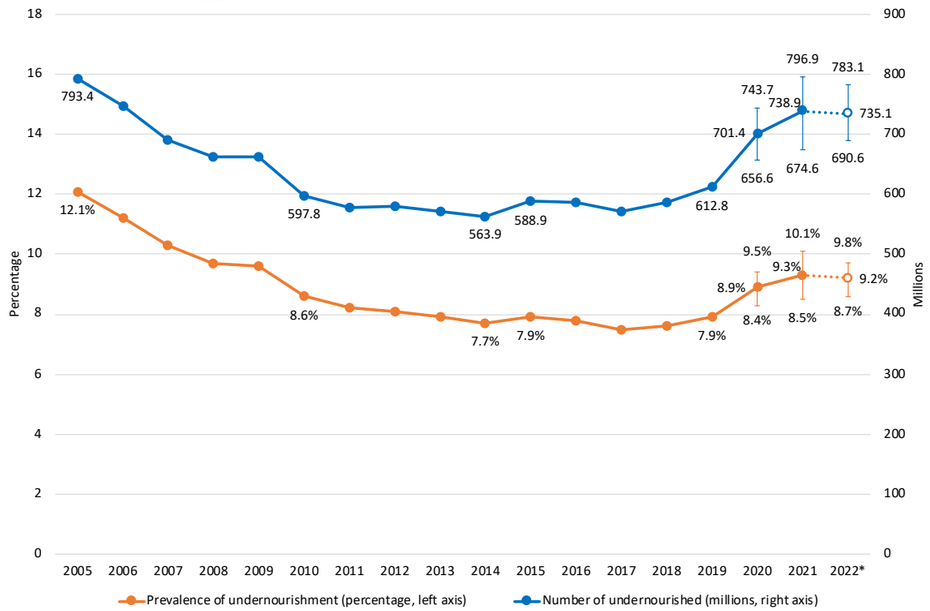
**Education & Outreach**
Public lecture series 'Agroecology and the Transition to Sustainable Food Systems'


**Research**
9 research projects funded by Center Research Programs in 2023

**Education**
Beans to Bars game at CAS 'Sustainable Food' at the Bern University of Applied Sciences

*We support innovations from the laboratory as well as through dialogue to create lasting positive change.*

Sustainable food systems help the world achieve critical progress on all 17 Sustainable Development Goals (Graphic: UN FAO).




Number and percentage of undernourished people in the world (2005–2022). The FAO tracks progress on food and agriculture-related SDG indicators, including those for Zero Hunger (Graphics: UN FAO).

# THE CENTER

ETH Zurich established the World Food System Center in 2011 to provide solutions for key challenges in our food system concerning food and nutrition security, environmental health, and social well-being. These challenges are more pressing than ever and demand a boost in public and private engagement, investment, and collaborative efforts.

**Food Systems and the Sustainable Development Goals**

The United Nations 2030 Agenda for Sustainable Development affirms 17 Sustainable Development Goals and 169 targets to build a better world. Fighting hunger is a central element of the SDGs, which are integrated and balance the three dimensions of sustainable development: economic, social, and environmental.

However, based on the latest estimates, we are not on track to end all forms of malnutrition by 2030, a key goal of SDG 2: Zero Hunger. Instead, nearly 30% of the world population were moderately or severely food insecure in 2022. And an estimated 22.3% of children under the age of five suffer from stunting. The intensification and interaction of conflict, climate extremes, and economic downturns, combined with highly unaffordable nutritious foods and growing inequality, all conflate to create an urgent situation.

To reduce both food system vulnerability and its environmental impact, we need to lower greenhouse gas emissions and increase efficiency in the use of inputs, for example, using precision farming technologies. We need to improve soil health and more generally build climate resilience of production systems. This requires a shift to sustainable concepts such as agroecology and production practices such as conservation agriculture, agroforestry, or integrated crop-livestock systems. Application of smart combinations of local knowledge and science-driven innovations is paramount.

Addressing only the supply side of food systems, however, will not be sufficient. Food loss and waste clearly shows the failures of our current food system. These losses contribute to greenhouse gas emissions and squander soil, water, and energy resources. Reducing losses in all economic sectors and treating waste and side streams as valuable resources in circular approaches need to be further explored and developed.

*Technology, adapted to local conditions, can be particularly important to boost the capacity of urban agriculture to supply nutritious foods.*

In areas of the world characterized by high consumption of animal-source foods, a shift in diets is an additional measure. However, providing affordable healthy diets is not an easy task. Even in Europe, the availability of vegetables, fruits, and pulses is insufficient to meet daily dietary requirements.

Further public investment in research and development is needed to develop technologies and innovations for healthier food environments as well as increasing availability and affordability of nutritious food. The Food and Agriculture Organization of the United Nations (FAO) proposes that technology can be particularly important to boost the capacity of urban and peri-urban agriculture to supply nutritious foods in cities and towns.

In order to advance food system transformation to achieve the SDGs, effective policies are required that support and coordinate actions. This approach, taking local conditions into account, should be co-developed by various actors, especially farmers, but also industries, retailers, policy makers and consumers. Effective solutions and concerted actions based on improved coordination, collaboration, and communication among all these actors are key. Only then can we successfully transform and build sustainable food systems that ensure food and nutrition security, human and environmental health, and social well-being for all across the globe.

«Collaborations with the global South enable knowledge transfer, which helps to empower local researchers and stakeholders. This ensures that scientific contributions are of direct benefit to local society. Exchange programs also help to sensitize researchers from the global North to the problems of the global South, in particular with implementation issues - experiences that are particularly important for the new generation of scientists.»

Pius Krütli
Former Co-director of Transdisciplinarity Lab, ETH Zurich
WFSC Member

Center members are actively engaged in collaborative research in countries across the globe. For example, ETH researchers are part of the **TropSEDs project**, measuring erosional transfer of carbon from source to sink in the Kasaï Basin leading to the Congo River.

The world food system is a complex system, comprised of many interconnected local and regional subsystems.

**The Center and its Approach**

In order to play a leading role in addressing the challenges of how to feed the world in a way that ensures human health, environmental sustainability, and social well-being, ETH Zurich established the World Food System Center (WFSC). The Center acts as a coordination and management platform to establish research, education, and outreach initiatives. It brings its members together to collaborate in interdisciplinary ways and with a variety of external partners.

We believe a broader adoption of a food systems approach allows building resilient food systems capable of providing food and nutrition security over the long term. Therefore, the work of the WFSC is based on the understanding that solutions to food system challenges require collaboration from stakeholders across the entire food value chain.

The programs of the Center bring opportunities to students, scientists, and professors who focus on food systems in their research and studies. Center activities also highlight the broad range of expertise at ETH Zurich working to address food systems challenges. Encouragement of inclusive and creative approaches is key, as is providing interactive platforms to engage with a wide range of local and global stakeholders from different sectors and disciplines.

**Values**

Seven core values dictate the organizational conduct of the Center. These core values dictate the (1) importance of academic independence and include a commitment to (2) sustainability, (3) transparency, (4) objectivity, (5) inter- and transdisciplinarity, (6) real world impact through partnerships, and (7) addressing global challenges of societal relevance.

*Our Vision: A healthy world through sustainable food systems.*

**Organization Structure**

The core of the WFSC is formed by the member groups, which in 2023 comprised 46 professors from seven different departments of ETH Zurich, four groups of Eawag, and one group of Empa (see Appendix). The multi-disciplinary pool of expertise of the member groups is a distinct competence of the Center, and allows for solution innovation across the food system and addressing challenges across disciplines and scales.

This astounding competence spans the food system, from environmental science, agricultural science, food science, nutrition, and immunology, and includes topics such as technology innovation, economics, as well as policy. This body of work continues in parallel with and is supported by the WFSC.

The Steering Committee oversees the strategy and operational functions carried out by the Executive Office. It is formed by a group of maximum ten elected members and led by the current Chair, Robert Finger.

**Partnership Approach**

The WFSC strives to work together with others in partnerships to achieve together what no partner could achieve on its own. Both strategic and collaborative partnerships are developed, and the WFSC indirectly fosters new partnerships at the project level. This partnership approach has been critical to the Center's success.

In close collaboration with the ETH Zurich Foundation, the Center established its strategic partnership network specifically to engage with industry and foundation partners who support our vision and mission through programs and projects. The strategic partnerships of the WFSC are coordinated through a Partnership Council, who members included Mercator Foundation Switzerland, Coop, Bühler, Migros, fenaco, Bayer, Nestlé, and Syngenta Crop Protection.

**Representation at Food Sector Events and Forums**

WFSC members and Executive Office staff regularly represent the Center at food system-themed events and forums organized by Swiss and international groups. This engagement in diverse forums and bodies allows the Center to bring a food system perspective to the respective tables.

For example, Executive Director Martijn Sonnevelt represents ETH Zurich in the Swiss National Committee of the UN FAO (CNS-FAO), a position nominated by the Swiss Federal Council. He was elected as President of the committee in January 2020. The legislative period of 2020 to 2023 focused on youth and work, the transformation of food systems, agroecology, and climate change, including sustainable animal husbandry.

The Center represents ETH Zurich in the Swiss Food and Nutrition Valley, a networking platform of Swiss food innovators. ETH Zurich is an academic partner of the network, and in 2023, Martijn Sonnevelt was part of the Executive Committee.

Further, the WFSC is also part of the Swiss Forum for International Agricultural Research (SFIAR), a multi-stakeholder platform that includes the Swiss Federal Office for Agriculture (FOAG), Swiss Development Cooperation (SDC), major Swiss agricultural research institutions, and NGOs. ETH Zurich researchers Samuel Levy and team as well as Lorenz Allemann won the 2023 SFIAR Awards for agricultural research for development.


The NICE project Winter School took place in Busia, Kenya in February 2023.

**Collaborative Partnerships**

The Center collaborates regularly with organizations who bring important and complementary expertise and networks to the table. Collaborative partnerships allows working together with stakeholders in a way that creates added value for both organizations without engaging in a permanent relationship involving binding commitments. In addition, the WFSC facilitates partnerships at the project level among academia, external partners, and stakeholders from a variety of different sectors.

For example, the Center is part of the Swiss Development Cooperation funded project, Nutrition in City Ecosystems (NICE). The project aims to improve urban diets in low- and middle-income countries. NICE promotes women and youth leadership and places a strong emphasis on public-private engagement and income generation. The consortium includes the Swiss Tropical and Public Health Institute, Sight and Life, ETH Zurich, and the Syngenta Foundation for Sustainable Agriculture.

In February 2023, Center staff, along with colleagues from the consortium, coordinated a peer-to-peer learning experience (Winter School). NICE country teams and representatives from all six NICE cities in Rwanda, Kenya, and Bangladesh came together in Busia, Kenya to exchange experiences and knowledge on urban food systems.

During the five days, the representatives shared successes and bottlenecks as well as plans and visions. In presentations, group work, field visits, and through informal exchanges, the group learned and discussed concrete activities and experiences with each other.

With different workshops and excursions, the group was empowered to learn from each other on how best to establish a sustainable city-region food system and to improve food and nutrition security. Invited experts explored the challenges and opportunities of sustainable food systems.

Excursions were part of the experience at the NICE Winter School in Kenya.



## New Member Highlights

«We investigate soil, hydrological, and physiological processes relevant for crop production in water-limited regions. Identifying plant properties and management practices that support yields during drought requires an interdisciplinary approach. The Center offers a great opportunity to share ideas and expertise and establish new collaborations to address this urgent problem.»

Andrea Carminati leads the Physics of Soils and Terrestrial Ecosystems Group in the ETH Zurich Department of Environmental Systems Science.

«In our global world, the hidden impacts of our consumption on the environment and societies can be easy to miss. Our work aims to clarify these complex effects using data science and mathematical modeling, highlighting how consumption in some areas can worsen food and water security elsewhere. Joining the World Food System Center, I'm excited to collaborate with diverse experts to find equitable, sustainable solutions for our food and water challenges."

Marc Müller is the Group Leader of Coupled Human-Water Systems at Eawag (Swiss Federal Institute of Aquatic Science and Technology).

«The immense potential of the gut microbiome to modulate multiple aspects of health and disease has fueled an expanding global market for novel probiotics. Thanks to the Center and the Future Food Initiative, we are now working on characterizing mechanisms by which nutritional interventions influence the establishment and functional ability of probiotic bacteria in the gut with the long-term goal of engineering better synbiotics.»

Randall Platt leads the Laboratory of Biological Engineering in the ETH Zurich Department of Biosystems Science and Engineering.

The Evolutionary Biology Group investigates fundamental questions about how predator-prey interactions shape microbial communities, which greatly influence the health and productivity of agricultural systems. In synergy with the WFSC goal of promoting sustainable agriculture, the group aims to reduce the use of synthetic chemicals such as fungicides in agriculture by developing predatory bacteria as biocontrol agents for limiting agricultural pathogens.

Gregory Velicer heads the Evolutionary Biology Group in the ETH Zurich Department of Environmental Systems Science.

# RESEARCH

The Center aims to generate new scientific knowledge with societal, political, and industrial relevance in a manner that supports real-world impact. We support innovations from the laboratory as well as through dialogue to create lasting positive change.

The World Food System Center (WFSC) enables novel interdisciplinary research that contributes knowledge and solutions to key food system challenges. The Center's core research activities also strive to provide leadership and foresight on issues connected to food and nutrition security based on innovative solutions. In order to do so, the Executive Office fosters and manages competitive research programs, develops and supports Flagship projects, and engages in special collaborations. These activities connect researchers from different disciplines with one another and with external partners and local stakeholders.

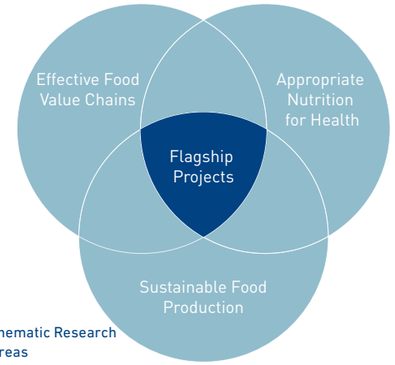
As promoted by the Food and Agriculture Organization of the United Nations (FAO), innovation is the central driving force that will transform food systems, lift millions of people out of poverty, and help the world to achieve food security and the Sustainable Development Goals (SDGs). With our work, we contribute directly to numerous SDGs, including No Poverty, Zero Hunger, Gender Equality, Sustainable Consumption and Production, and Good Health and Well-Being.

The innovative research supported by the Center builds directly on the strengths of its 46 members. In addition, various activities are planned to raise awareness of inter- and transdisciplinary research projects. Research results are incorporated in various education and outreach projects to ensure highlighting of promising pathways to support sustainable transformation of food systems. Our members also work directly with local stakeholders around the world to implement solutions for change.

**Thematic Research Focus Areas**

The Center adopts a systems perspective for its research that takes place within interlinked thematic focus areas: *Effective Food Value Chains*, *Appropriate Nutrition for Health*, and *Sustainable Food Production*. These areas guide the Center's research initiatives and connect them to food system challenges of societal relevance. Resilience and resource efficiency are core concepts for the Center's work on food value chains and production systems. Diversity and safety are underlying principles for our work on food production and appropriate nutrition.

Flagship research projects showcase a food systems approach and tackle large questions at the intersection of the focus areas, where ETH Zurich is uniquely positioned to contribute to solutions for the world's pressing challenges.




WFSC Thematic Research Focus Areas

*Innovation is the central driving force that will transform food systems and help the world to achieve food security and the SDGs.*

Recycling cassava peelings into animal feeds at the Nyamiyaga Akanoze factory in Rwanda. The owner, Alice Nyirasagamba, received training on the recycling technology through the RUNRES project.

The fields of the ETH Plant Science Research Station are a place to trial new methods for more sustainable agricultural production.

«The importance of plant-based foods is growing rapidly. Research into which varieties of pulses, cereals, and oil plants have great potential is extremely important. A holistic systems approach that combines health, sustainability, and enjoyment is needed more than ever. This approach requires methods from many fields, including agroecology, plant breeding, and artificial intelligence.»

Achim Walter
Professor of Crop Science, ETH Zurich
WFSC member

Researchers collecting smartphone images of crop fields at ETH Plant Science Research Station to create visual renditions of crop development.

**Research Programs**
The Center's Research Programs support new cross-disciplinary and solution-oriented research to address food system challenges. All projects are subject to a rigorous evaluation and an assessment process that takes into account scientific excellence and relevance to the programs. These programs produce scientific publications and briefs for practice (see Appendix).

To date, the Center's programs have supplied over 17 million Swiss Francs to research project funding at ETH Zurich. For example, the Uniscientia Foundation supported two research projects in 2023 addressing environmental and human health risks of food systems. One of these new projects aims to characterize toxicological risks associated with food contaminants and novel ingredients.

Learn more about all the programs at **https://worldfoodsystem.ethz.ch/research/research-programs**.

**Smart Sustainable Farming**
The **Smart Sustainable Farming Research Program** aims to contribute to sustainable, innovative, and competitive agricultural production and increase transparency from agricultural production to consumers. The program is supported by fenaco, with a donation of 1.2 million Swiss Francs.

In the call for projects in 2023, two new interdisciplinary projects were funded. Projects investigate the use of smartphone imaging to increase sustainability of crop production, genetic and robotic technologies for pest detection in vineyards, and ChemiResistive sensors for effective agricultural nitrous oxide mitigation.

*We strive to create actionable knowledge to be shared in dialogue with a wide audience.*

**Improving Sustainability of Agricultural and Food Systems**
The goal of the **Improving Sustainability of Agricultural and Food Systems across Key Environmental Metrics Research Program** is to understand the benefits and tradeoffs of various measures in agricultural systems and production practices while maintaining the production potential and strengthening overall resilience of the agricultural system towards climate impacts and biodiversity.

In the frame of this program, Bayer AG supports several interdisciplinary research projects of the World Food System Center with a total donation of 1.1 million Swiss Francs. Research results will be shared with the agriculture sector, other research institutions, companies, and the public.

After a successful call for projects in 2023, two funded projects will start in 2024. One aims to identify efficient pea varieties with high nitrogen fixation potential and protein production. The other advances the understanding of how different crop rotation practices affect water and nitrogen balances.

**Future Food Initiative**
ETH Zurich and EPFL launched **Future Food Initiative** in 2018 together with Swiss food industry leaders Bühler, Givaudan, and Nestlé. The goal of this initiative is to expand research and education in the area of food and nutrition sciences. The fellowship program within the initiative aims at bringing together competences from academic and industrial research in this field. The program is co-managed by the WFSC and the Integrative Food Science and Nutrition Center at EPFL.

The initiative provides these fellows, host professors, and the Center a great opportunity to further develop collaborations with industry and EPFL. The program has now supported twelve fellows working on diverse topics. Together, all partners and fellows of the initiative are building a strong Swiss food science ecosystem.


Eva Galle presenting her Future Food Fellowship research on lactate-fortified foods to improve muscle function at Food Day @ETH 2023.

**Special Collaborations**
The Center engages in practice-oriented research via special projects with partners to support real-world agenda setting and decision-making. The role of the WFSC in these projects is not necessarily to conduct research but rather to support the project teams by providing expertise in education and outreach.

Examples of such activities include being an education partner for the ETH Domain funded project 'Engage - Evidence-based dialogue on trade-offs in wicked societal problems'. The Center is involved in the capacity building components of the project. Contributions of the Center focus on developing educational programs that bring actors from policy and practice together with researchers and other stakeholders from across the food and energy systems.

In 2023, a targeted workshop with almost thirty invited guests from science, policy, and practice explored the question, what competencies and personal qualities are needed for a successful dialogue at the interface of science, policy, and practice?

Johanna Jacobi and Kenza Benabderrazik sharing their research on agroecology and agroforestry with the FAO delegation during a visit to ETH Zurich.

### Flagship Projects

Flagship projects supported by the Center should be visionary and potentially high risk; take a food systems or whole of value chain approach; involve at least three investigators from different disciplines; and involve key stakeholders from industry, government, and NGOs, in non-competitive roles.

In 2023, the Center supported the work of two Flagship projects. **Enhancing Resilience in Food Systems** is an initiative of the Sustainable Agroecosystems Group and the TdLab. Initiated in 2013 and led by Center member Johan Six, it addresses how food systems can be made more sustainable under multiple, unpredictable drivers of change. Support for the multiple subprojects comes from a wide range of food system actors, such as the Swiss Federal Office for Agriculture (FOAG), the FAO, multi-national companies and organizations, and academic partners.

The Flagship **Novel Proteins for Food and Feed** involves many member groups, with Center member Alexander Mathys as Principal Investigator. This project aims to develop food innovations to provide new sources of sustainable and nutritious protein for a growing world population. The project enables the broad exploration of microalgae and insect proteins for more sustainable food and feed. In 2023, work continued on projects focused on urban food waste management with black soldier fly larvae in Switzerland and Singapore.

### Collaborations for Change

In summer 2023, a delegation of representatives from the Food and Agriculture Organization of the United Nations (FAO), the FAO Liaison Office in Geneva, and the Swiss Federal Office for Agriculture visited the World Food System Center. Ismahane Elouafi, FAO Chief Scientist, and Vincent Martin, Director of the FAO Office of Innovation, were part of the delegation looking to exchange ideas on innovations for bringing needed change to the food system.

Robert Finger, Chair of the Center, and Benedikt Knüsel, ETH Office of Knowledge Transfer and Corporate Relations, welcomed the visitors. Several Center members then presented their work on topics such as smart farming implementation and policy, agroecology and agroforestry, and sustainable protein sources. The group then discussed possible collaborations to drive change. Such exchange facilitates the transfer of knowledge from research at universities into international contexts. Discussions continue with the FAO Office of Innovation.



## Research Highlights

The Flagship Project Enhancing Resilience in Food Systems seeks to directly contribute to food systems resilience by supporting decision-making in practice through stakeholder participation in case studies and academic education. In 2023, the RUNRES (Rural-Urban Nexus: Establishing a nutrient loop to improve city-region food system Resilience) project entered its second phase of developing and now upscaling innovations for circular economies in the rural-urban nexus. Private-public-partnerships will continue to play an important role in the participating countries: Ethiopia, Rwanda, South Africa, and the Democratic Republic of the Congo.

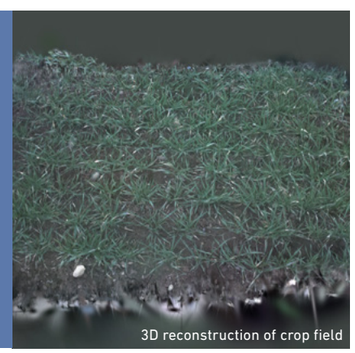
An innovation area of the Novel Proteins for Food and Feed Flagship Project focuses on identifying, designing, and validating processes to enable microalgae derived proteins for food applications. Many developments occurred in 2023, including creation of novel microalgae-based foods as well as a study on Singaporean consumers' acceptance of such foodstuffs. In addition, The Urban Microalgae Protein Production Project at the Singapore-ETH Centre held its first SEC x Wageningen Science Symposium in November. Researchers discussed current results from work focused on bioengineering, microalgae, and black soldier fly larvae to secure access to nutritious, affordable food.


The PestiFreeAgSys project investigates the economic viability, farmer uptake, and policy options to foster adoption and diffusion of zero- and low-pesticide production systems. At Food Day @ETH 2023, Eileen Ziehmann presented results from a case study focused on Swiss winter wheat.

Findings show that given sufficient financial support, non-chemical weed control strategies out-perform herbicide use. Also, information provided by remote-sensing technologies has the potential to reduce the number of mechanical interventions.

The Smart Sustainable Research Program supports a project investigating the use of smartphone imaging to increase sustainability of crop production. The goal is to improve decision support of farmers, based on high-quality visual representations of the past, current, and projected future status of the crop field.

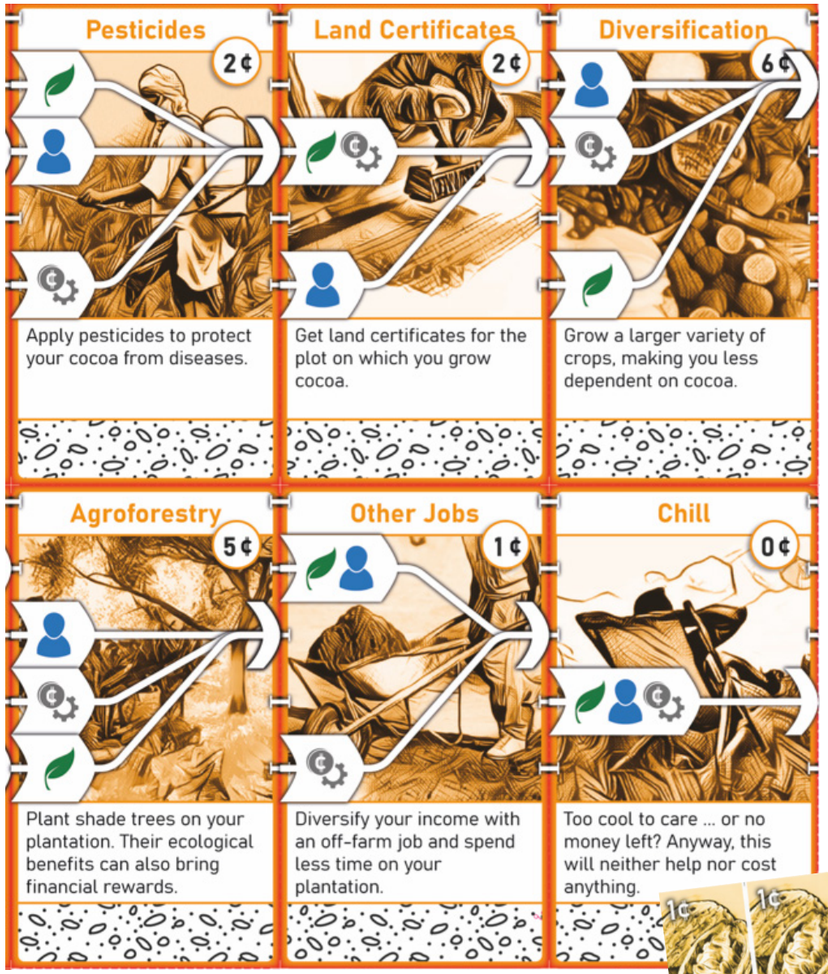
By collecting smartphone images of crop fields at points in time, field visualizations will be created using a combination of machine learning, crop growth models, and visualization technologies. Farmers could then receive visual renditions of the past and near-future development of their crops.



3D reconstruction of crop field

# EDUCATION

The education activities of the Center focus on building capacity in the next generation of decision makers to provide leadership for sustainable food systems issues.




From Beans to Bars: This role-play game developed at the Center explores numerous challenges along the cocoa value chain.

The World Food System Center (WFSC) aims to support young talents from ETH Zurich and the world to become the next generation of leaders to tackle complex food system challenges. The Center focuses, therefore, on enriching ETH Zurich curricula with innovative approaches to education that teach participants to navigate complexity and build sustainable food systems.

The Center has organized a range of education activities including intensive summer schools and extra-curricular courses and excursions. All of these activities are built on an interdisciplinary, critical thinking approach that emphasizes a food systems perspective and involves innovative teaching methods. We offer opportunities to undergraduate and graduate students enrolled at the ETH Zurich, other Swiss universities and colleges, and institutions abroad.

From 2013-2022, the cornerstone of the Center's educational activities was the World Food System Summer School program that brought together 235 students and young professionals from ETH Zurich and universities from around the world for two-week intensive courses. The course was hosted in Switzerland, India, South Africa, and Côte d'Ivoire.

**Food Systems Thinking**

The concept of food systems is key to understand the complex framework of actions needed to ensure food and nutrition security of present and future generations. In various courses, WFSC members and staff introduced such ideas to student and professionals.

*Our education courses teach participants to navigate complexity and build sustainable food systems.*

For example, in the ETH Zurich World Food System course, bachelor students learn about current research in agricultural and food sciences. Using case studies, connections in the food system among production, processing, and consumption are presented.

In addition, Martijn Sonnevelt introduced food system issues at the Certificate of Advanced Studies in Public Governance and Administration at the Swiss School of Public Governance of ETH Zurich. This continuing education program provides competencies needed to tackle complex governance challenges. With a focus on the interplay of climate and food systems, Martijn Sonnevelt was also a guest lecturer in the introduction course of the ETH Atmosphere and Climate Master Studies in September 2023.

ETH students at the FAO in Rome in April 2023.

«The course with a visit to the FAO in Rome is an extraordinary intellectual stimulus for everyone! There are lots of debates, and as lecturers, we make sure that students prepare relevant questions in advance and that the experts are concise enough to ensure that the debates have their place and create a positive dynamic for mutual learning. Some students become passionate about the subject and start their careers as interns in this organization.»

Dominique Barjolle
Senior Researcher in sustainable agrifood value chains,
ETH Zurich & University of Lausanne
WFSC member


A selected delegation of nine students and researchers represented ETH Zurich at the Global Youth Forum of the World Food Forum.

**Food Security and Resilient Food Systems at FAO**
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.

The course in April 2023 focused on the role of agroecology for improved nutrition in city ecosystems. The students explored how farmers and cooperatives, (social)business models, or local governance systems can potentially increase the production and demand for foods produced locally and based on agroecological principles. The course was based on case study analysis of examples used in the NICE project and from FAO work to make food value chains more nutrition-focused and to contribute to better health. The students investigated how multi-stakeholder and multisectoral collaboration can bring city authorities, local businesses, and civil society together to create a dynamic network.

At the visit to Rome, the students met with experts from the FAO and other organizations. The discussions were an eye-opener to the world of international organizations and inter-state regulation methods that are so important in tackling global challenges such as world hunger and climate change.

**World Food Forum**
A selected delegation of nine students and researchers represented ETH Zurich at the Global Youth Forum of the World Food Forum, held at the FAO in Rome from 16-20 October 2023. The theme of the forum was 'Agrifood systems transformation accelerates climate action.'

The ETH Zurich Youth Delegation had the opportunity to interact and exchange with leaders and youth from around the globe about pressing issues that our local and global food systems face. In their statement, the delegation stated, "This was a useful and enriching experience from which we learned a lot. Hearing and understanding how politicians versus scientists conceptualize solutions to our sustainability problems will be key in instrumentalizing future change. Nevertheless, we hope for more bold and concrete action plans that can truly help drive society and agri-food systems towards a more sustainable future."

*We provide extra-curricular opportunities for students to develop science-policy experience.*

**Education Tools**
Based on research from Center member groups, Jon Wirthner and Braida Thom developed the Beans to Bars educational role-play game. The game uses the cocoa value chain as a starting point to explore food systems. Players take different stakeholder perspectives to learn about challenges and solutions related to environmental, economic, and social sustainability. Since 2021, the game has been played with numerous audiences, from high school students to teachers and university students.

The game was presented at the CAS 'Sustainable Food' at the Bern University of Applied Sciences in fall 2023. The various participants, including dietitians, food engineers, and hotel managers, learned about the different steps of the cocoa value chain and the stakeholders involved. One participant shared after, "This helped me to understand the complexity of the food system and the numerous interdependencies. It takes courage (and a budget!) to innovate towards a more sustainable food system."

**World Food System Center Alumni**
Through the Center's educational activities, a growing interdisciplinary and global community of alumni has been created. In 2019, the WFSC alumni community founded the World Food System Network. The vision of the organization is to cultivate a collaborative international network that inspires and leads change towards sustainable food systems. On the platform, alumni can discuss ideas, look for collaborators, and post opportunities and events.

In the quarterly newsletter of the Center, the Alumni Stories feature provides updates on various activities, such as Bloom, a community garden project in Zurich. Recent highlights at the garden include permaculture and mushroom workshops and a film series.

Find out more about our alumni at **https://worldfoodsystem.ethz.ch/education/alumni-support**.

Alumni meeting at the Bloom community garden to share in the harvest.

# OUTREACH

The Center engages with a broad audience to share and discuss knowledge and innovations that support the achievement of the Sustainable Development Goals.

The World Food System Center (WFSC) aims to increase awareness and enact action to help the transformation of food systems and thereby support the achievement of the UN Agenda 2030 for Sustainable Development. In order to do so, the Center organizes numerous outreach events and creates materials for communication to assist in dialogue with various stakeholders.

By allowing a broad scope for outreach, the Center is able to explore the breadth of the food system in its activities. Diverse stakeholders are engaged by using varied platforms and venues, ranging from public events and lectures, exhibitions and guided tours, webinars, and direct discussions. Such activities have reached thousands.

Along with the Center's communication materials and channels, outreach activities make visible the expertise at ETH Zurich and its contribution to global challenges. The expertise of its members is often complemented with the experience of colleagues and peers from outside ETH Zurich.

These activities are crucial, as the way the world produces, consumes, and wastes food is far from sustainable. Food system transformation requires a complete change in the way we produce but to a large extent the way we consume food. Long-term sustainability and resilience of the entire food system requires not only technological innovations but also innovations in terms of governance and regulations to support the shift in consumption needed to reduce the environmental impact of the food system.

*Dialogue and outreach increases awareness of challenges in the world food system and promising approaches to create solutions.*

At OLMA 2023, the ETH Zurich stand at Canton of Zurich 'Family Garden' exhibition highlighted research from four Center member groups.


Massimo Bagnani talked with visitors about his work on plastic made from soybean production sidestreams at the Canton of Zurich 'Family Garden' exhibit at OLMA.

«With the Agroecology Public Lecture Series, we provide first-hand insights into science and practice. Such events are urgently needed. They foster dialogue, transfer scientific evidence and practical applications, and inform consumers who, in the end, determine what is produced within food systems globally. We have a responsibility to provide platforms for balanced discussions, but I am convinced we achieve this and, thus, serve society.»

Nina Buchmann
Professor of Grassland Sciences, ETH Zurich
WFSC member


Visitors to the ETH Zurich 'Where the future begins – Research for sustainable agriculture' exhibit at OLMA included Federal Councilor Karin Keller-Sutter.

**Public Events and Research Symposium**

The Center organizes numerous scientific events aimed at increasing awareness of the informed public about both the challenges in the world food system and system-based approaches to addressing them. In 2023, the Center organized eight events plus a public lecture series consisting of eight webinars, reaching a total of well over 2000 people (see Appendix). Many events were jointly organized with WFSC members and partner centers and institutions.

### Agroecology and the Transition to Sustainable Food Systems

This public lecture series, started in 2021, continued with eight lectures in 2023. Many of the public lectures were thematically structured along the 13 principles of agroecology, proposed by the High-Level Panel of Experts for Food Security and Nutrition of the Committee on World Food Security. Experts on the various elements of agroecology shared their state-of-the-art knowledge. They discussed the potential of agroecology to contribute to sustainable food system transformation but also challenges and limitations. Recordings of the discussions are available on the Center's YouTube channel.

The series is part of the ETH Zurich Department of Environmental Systems Science course of the same name, which was developed in collaboration with the Grassland Sciences Group at ETH Zurich.

### Scientifica and OLMA 2023

In fall 2023, the Center contributed to several public dialogue events. At Scientifica, the public science event of ETH Zurich and the University of Zurich, researchers were on hand to talk to visitors about innovations for sustainable food systems.

At the OLMA Swiss Fair for Agriculture and Nutrition, research from several WFSC member groups was on display at both the ETH Zurich 'Where the future begins – Research for sustainable agriculture' exhibit and Canton of Zurich 'Family Garden' exhibit. By playing Agricultural Policy Jenga or taking a look at the glowing microalgae reactor, visitors could learn more about innovations being used in the fields and creating new foods for our plates.

Swiss Federal Councilor Karin Keller-Sutter, while visiting the ETH exhibit, commented, "Research and innovation play an important role in future agriculture. ETH Zurich is making an important contribution in this respect."

*We invite all to reach out to us with ideas for outreach or dialogue for food systems transformation.*

### Food Day @ETH

Every year, the Center organizes Food Day @ETH. This symposium highlights research supported by the Center as well as showcasing other food system related research at ETH Zurich. The plenary and networking poster sessions bring together a diverse audience from academia, industry, government, and international organizations.

The event in November 2023 kicked off with workshops in the afternoon, focusing on topics including grassland use, nutrition, and science policy. At the workshop 'More than Cheese,' participants learned from researchers and practitioners such as farmers about different options to sustain and enhance ecosystem services and grassland multifunctionality. The workshop was a collaboration with the ETH Zurich Grassland Sciences Group, Agroscope Forage Production and Grassland Systems Group, and SVIAL (Schweizerischer Verband der Ingenieur-Agronom:innen und Lebensmittel-Ingenieur:innen).


Food Day @ETH poster prize winners with Executive Director Martijn Sonnevelt.

The plenary session focused on the topic of engaging youth in food systems transformation. The symposium gave young researchers and practitioners a chance to share their ideas and passion. Oral presentations from Center-funded projects highlighted research on agriculture, nutrition, and equitable livelihoods. Guests then joined in a cross-generational chat about empowering actors to transform the food system.

The Networking Poster Session showcased over 40 posters displaying ongoing food system research and Center initiatives and offered the over 200 participants the chance to interact directly with researchers. The audience selected three poster awards during the session. The winning posters focused on 'Microbial biodiversity of fermented foods,' 'Mixed cropping of lentils and oats reduces input requirements and increases productivity in Swiss agriculture,' and 'Impact of fermentation on cereal β-glucan in plant-based yogurt.'


Martijn Sonnevelt on the SRF Club Summer Series 'Politics on the Plate' discussing climate and nutrition with Swiss politicians.

**Research Dissemination and Dialogue**

The Center prepares content, discovers opportunities for dissemination, and ensures that the Center with all its activities and projects communicates strategically and in coordination with ETH Corporate Communications efforts. The Center has established and manages its own communication platforms to further support these efforts.

The Center aims to be a point of reference for food system research at ETH Zurich. The Center's website is a venue to communicate news and findings. The Center also produces a quarterly newsletter, bringing news highlights and member updates to a network of over 1860 interested subscribers. In 2023, the Center's social media presence included several platforms, including LinkedIn and X for sharing food systems news and events. The Center's YouTube channel hosts many videos highlighting research outcomes and featuring scientists from Center supported projects. Four new videos premiered in April 2023, including 'Delicious diversity' and 'Insects for iron.'

Additionally, Center members and Executive Office staff regularly contribute to food system-themed events and exhibits. This participation allows for an increased inclusion of science into the societal dialogue on food system challenges.

Highlights in 2023 included Executive Director Martijn Sonnevelt joining the SRF Club Summer Series 'Politics on the Plate.' This series served as a platform for dialogue on food politics, bringing together different perspectives from politics, practice, and society. While enjoying a meal together, Martijn joined three Swiss politicians as well as an organic farmer to discuss food choices, climate, and nutrition.

Martijn Sonnevelt also gave keynote addresses and moderated expert panels at many Swiss food sector events, including the Future Food Symposium, Swiss Green Economy Symposium, and Spirit of Bern. Chair Robert Finger also introduced the Center at Café Scientifique of Life Science Center Zurich in May 2023.

World Food System Center, ETH Zurich

@ethzwfsc

World Food System Center ETH Zurich



## Outreach Highlights


The ongoing public lecture series 'Agroecology and the Transition to Sustainable Food Systems' provides a variety of perspectives on the topic of agroecology. Invited experts discuss benefits and the potential of agroecology to contribute to sustainable food system transformation but also challenges and limitations.

In the spring 2023, five lectures highlighted the principles of connectivity, input reduction, recycling, fairness, and soil health. In fall, each lecture provided a different perspective on agroecological transformation.

The AI+X Summit, organized by the ETH AI Center and Entrepreneurship Club, aims to foster exchange, collaboration, and technology transfer between academia and the business world.

At the Center-organized workshop 'Field to Fork: AI on our plates,' invited speakers from research and industry focused on how AI technology can contribute to sustainable, innovative, and competitive agricultural production and increase transparency from producers to consumers. Over 50 people attended the workshop, engaging with the speakers Michael Buser (fenaco), Lukas Roth (ETH Zurich), and Sharon Wulff (AgriNorm).


As part of the Open Your Eyes Photo Festival, a panel discussion brought together experts and ETH Zurich students to discuss the sustainability of Swiss food production. The discussion, which was moderated by Edith Hollenstein from *Tages-Anzeiger*, started with questions about growth and the current state of organic production in Switzerland.

Urs Niggli, President of the Institute for Agroecology, and Urs Brändli from Bio Suisse highlighted the limits and opportunities of organic farming. The discussion later shifted to a lively debate on the sustainability of animal production.

Food Day @ETH 2023 kicked off with workshops in the afternoon. The 'Unlocking the Potential of Precision Nutrition' workshop, organized with the Swiss Food and Nutrition Valley, aimed to foster collaboration, generate innovative ideas, and drive progress in the field of precision nutrition for the betterment of public health. The workshop 'Best Practices for the Science-Policy Interface' provided an overview of the science-for-policy approach of the ETH Science-Policy Interface. Participants at the 'More than Cheese' workshop discussed how policy-makers and practitioners can support grassland multifunctionality in Switzerland for a sustainable future.

# Appendix

## World Food System Center Members

Members
* Indicates Member of Steering Committee
** Indicates Chair of Steering Committee


## Associated Groups

ETH for Development (ETH4D), Dr. Adina Rom
Citizen Science Zurich, Dr. Rosy Mondardini

## Associated Emeritus Professors

Prof. Peter Edwards, Plant Ecology
Prof. Wilhelm Gruissem, Plant Biotechnology
Prof. Michael Kreuzer, Animal Nutrition
Prof. Gerhard Schmitt, Information Architecture
Prof. Rainer Schulin, Soil Protection
Prof. Erich Windhab, Food Process Engineering



# Appendix

## Executive Office Staff

The Executive Office is responsible for the management and operation of the Center and its research, education, outreach, and communication activities. Together with the Steering Committee, the Executive Office develops and implements the strategy of the Center and builds strategic partnerships and collaborations. It is the central hub for facilitating exchange between members and external partners from academia, industry, government, and the not-for-profit sector.

**Dr. Martijn Sonnevelt**
Executive Director

**Billie Maude Hauser**
Research and Outreach Manager

**Monika Siegrist**
Education Manager

**Dr. Jeanne Tomaszewski**
Communications and Outreach Manager

**Selina Hess, Vashita Nath**
Student Project Staff

## Summary of Consolidated Financials (Infrastructure and Program)

| | |
|---|---|
| TOTAL INCOME | 627'897 |
| TOTAL EXPENSES | 440'510 |

# Appendix

## Selected Publications from WFSC Research Programs and Flagship Projects 2023


Axelrod, R. D.; Baumgartner, J.; Beyrer, M.; Mathys, A. (2023) Experimental and simulation-based investigation of the interplay between factor gradients following pulsed electric field treatments triggering whey protein aggregation. *Journal of Food Engineering*, 340, 111308.

Bertsch, P.; Böcker, L.; Palm, A.-S.; Bergfreund, J.; Fischer, P.; Mathys, A. (2023) *Arthrospira platensis* protein isolate for stabilization of fluid interfaces: Effect of physicochemical conditions and comparison to animal-based proteins. *Food Hydrocolloids*, 136, 108290.

Gold, M.; Niermans, K.; Jooste, F.; Stanford, L.; Uwamahoro, F.; Wanja, M.; Veldkamp, T.; Sanderson, A.; Nunes, V. D. S.; Mathys, A.; Fels-Klerx, H. J. van der; Hil, E. F. H. den; Nishimwe, K. (2023) Conversion of mycotoxin-contaminated maize by black soldier fly larvae into feed and fertilizer. *Journal of Insects as Food and Feed*, (aop).

Green, A.; Nemecek, T.; Mathys, A. (2023) A proposed framework to develop nutrient profiling algorithms for assessments of sustainable food: The metrics and their assumptions matter. *International Journal of Life Cycle Assessment*, 28 (10), 1326–1347.

Heuel, M.; Kreuzer, M.; Gangnat, I. D. M.; Frossard, E.; Zurbrügg, C.; Egger, J.; Dortmans, B.; Gold, M.; Mathys, A.; Jaster-Keller, J.; Weigel, S.; Sandrock, C.; Terranova, M. (2023) Low transfer of cadmium, lead and aflatoxin B1 to eggs and meat of laying hens receiving diets with black soldier fly larvae reared on contaminated substrates. *Animal Feed Science and Technology*, 304, 115733.

Ingram, J.; Bellotti, W.; Brklacich, M.; Achterbosch, T.; Balázs, B.; Banse, M.; Fielke, S.; Gordon, L.; Hasnain, S.; Herman, L.; Kanter, R.; Kaye-Blake, W.; Mounsey, J.; Pihlanto, A.; Quinlan, A.; Six, J.; Stotten, R.; Tomich, T.; Tóth, A.; Yacamán, C.; Zurek, M. (2023) Further concepts and approaches for enhancing food system resilience. *Nature Food*, 4 (6), 440–441.

Mouhrim, N.; Peguero, D. A.; Green, A.; Silva, B.; Bhatia, A.; Ristic, D.; Tonda, A.; Mathys, A.; Smetana, S. (2023) Optimization models for sustainable insect production chains. *Journal of Insects as Food and Feed*, (aop).

Peguero, D. A.; Gold, M.; Duewell, T.; Waser, A.; Dubovcova, B.; Vandeweyer, D.; Zurbrügg, C.; Mathys, A. (2023) Low energy electron beam to support safe whole dried insect products. *Journal of Insects as Food and Feed*, 10 (3), 473–489.

Peguero, D. A.; Gold, M.; Endara, A.; Niu, M.; Zurbrügg, C.; Mathys, A. (2023) Evaluation of ammonia pretreatment of four fibrous biowastes and Its effect on black soldier fly larvae rearing performance. *Waste Management*, 160, 123–134.

Qin, S.; Wang, K.; Gao, F.; Ge, B.; Cui, H.; Li, W. (2023) Biotechnologies for bulk production of microalgal biomass: From mass cultivation to dried biomass acquisition. *Biotechnology for Biofuels and Bioproducts*, 16 (1), 131.

Sägesser, C.; Kallfelz, J. M.; Boulos, S.; Hammer, L.; Böcker, L.; Portmann, R.; Nyström, L.; Mathys, A. (2023) A novel approach for the protein determination in food-relevant microalgae. *Bioresource Technology*, 390, 129849.

Sekabira, H.; Simbeko, G.; Feleke, S.; Manyong, V.; Späth, L.; Krütli, P.; Vanlauwe, B.; Kintche, K.; Wilde, B.; Six, J. Determinants and success of engagement in circular bioeconomy practices in African food systems. *Cleaner and Circular Bioeconomy*, 6, 100065.

Siegrist, A.; Green, A.; Gold, M.; Mathys, A. (2023) Recent findings on environmental sustainability and conversion efficiency of waste-to-protein pathways. *Current Opinion in Green and Sustainable Chemistry*, 41, 100833.

Siegrist, M.; Hartmann, C. (2023) Why alternative proteins will not disrupt the meat industry. *Meat Science*, 203, 109223.

Speich, C.; Barth-Jaeggi, T.; Musard, C.; Sécula, F.; Kraemer, K.; Barjolle, D. (2023) Nutrition in City Ecosystems (NICE): Protocol of a multi-sectoral development project to improve food and nutrition security of secondary city populations in Bangladesh, Kenya and Rwanda. *Frontiers in Public Health*, 11.

Spescha, A.; Weibel, J.; Wyser, L.; Brunner, M.; Hess Hermida, M.; Moix, A.; Scheibler, F.; Guyer, A.; Campos-Herrera, R.; Grabenweger, G.; Maurhofer, M. (2023) Combining entomopathogenic *Pseudomonas* bacteria, nematodes and fungi for biological control of a below-ground insect pest. *Agriculture, Ecosystems & Environment*, 348, 108414.

Spescha, A.; Zwyssig, M.; Hess Hermida, M.; Moix, A.; Bruno, P.; Enkerli, J.; Campos-Herrera, R.; Grabenweger, G.; Maurhofer, M. (2023) When competitors join forces: Consortia of entomopathogenic microorganisms increase killing speed and mortality in leaf- and root-feeding insect hosts. *Microbial Ecology*, 86 (3), 1947–1960.

Surchat, M.; Irakoze, M.; Hansmann, R.; Kantengwa, S.; Konlambigue, M.; Späth, L.; Wilde, B.; Six, J.; Krütli, P. (2023) Jobs in the circular bioeconomy under scrutiny: The challenging reality of compost production in Rwanda. *World Development Sustainability*, 3, 100094.

Surchat, M.; Irakoze, M.; Kantengwa, S.; Konlambigue, M.; Späth, L.; Wilde, B.; Six, J.; Krütli, P.; Stauffacher, M. (2023) "The bad job brings the good one": Photovoice study with female and male waste workers in Rwanda. *Local Environment*, (aop).

Thompson, W. J.; Varma, V.; Joerin, J.; Bonilla-Duarte, S.; Bebber, D. P.; Blaser-Hart, W.; Kopainsky, B.; Späth, L.; Curcio, B.; Six, J.; Krütli, P. (2023) Smallholder farmer resilience to extreme weather events in a global food value chain. *Climatic Change*, 176 (11), 152.

Wittwer, R. A.; Klaus, V. H.; Miranda Oliveira, E.; Sun, Q.; Liu, Y.; Gilgen, A. K.; Buchmann, N.; van der Heijden, M. G. A. (2023) Limited capability of organic farming and conservation tillage to enhance agroecosystem resilience to severe drought. *Agricultural Systems*, 211, 103721.

Zehnder, T.; Schneider, M. K.; Lüscher, A.; Giller, K.; Silacci, P.; Messadène-Chelali, J.; Berard, J.; Kreuzer, M. (2023) The effects of *Alnus viridis* encroachment in mountain pastures on the growth performance, carcass and meat quality of Dexter cattle and Engadine sheep. *Animal Production Science*, 63 (12), 1248–1260.




## Public and Specialist Events Organized by WFSC and Partners 2023

| Event | Date | Location | Participants | Speakers | Organizers |
|---|---|---|---|---|---|
| IFNH Seminar: Farmed Insects in Yellow Biotechnology | Jan 2023 | ETH Zurich | 60 | Andreas Vilcinskas | Sustainable Food Processing Group, WFSC |
| Public Webinar: Agroecology and the Transition to Sustainable Food Systems<br>Connectivity<br>Input Reduction<br>Recycling<br>Fairness<br>Soil Health | Feb-Mar 2023 | Online | 275 (whole series) | Elvira Zingg, Benjamin Gräub, Frank Liebisch, Anna Spescha, Christian Zurbrügg, Ben Wilde, Loredana Sorg, Johanna Jacobi, Martin Hartmann, Raphaël Wittwer | WFSC |
| Visit of delegation of representatives from FAO, FAO Liaison Office in Geneva, and Swiss Federal Office for Agriculture | Jun 2023 | ETH Zurich | 30 | Nina Buchmann, Robert Finger, Bruno Studer, Achim Walter, Johanna Jacobi, Kenza Benabderrazik, Alexander Mathys, Ashley Green, Daniela Peguero, Hélène Iven | WFSC |
| Scientifica Exhibition 'Innovation on our plates' | Sep 2023 | ETH Zurich | 1000 | | D-USYS, WFSC |
| Panel Event 'Switzerland an organic country? Vision or nutritional nightmare?' at Open Your Eyes 2023 Photo Festival | Sep 2023 | ETH Zurich | 40 | Urs Niggli, Urs Brändli, Hanspeter Renggli, Freddy Hunziker, Vivienne Hanke, David Tschan, Edith Hollenstein | Alnatura, Students of ETH Zurich, Tages-Anzeiger, WFSC |
| Public Webinar: Agroecology and the Transition to Sustainable Food Systems<br>Science Perspective on Agroecological Transformation<br>Policy Perspective on Agroecological Transformation<br>Agroecology as a Tool for Food System Transformation | Oct 2023 | Online | 180 (whole series) | Johanna Jacobi, Laura Spring, Emile Frison | WFSC, Grassland Sciences Group |
| OLMA Swiss Fair for Agriculture and Nutrition- ETH Zurich ' Where the future begins – Research for sustainable agriculture' Exhibit and Canton of Zurich 'Family Garden' Exhibit | Oct 2023 | St. Gallen | ~330'000 | With input from 7 WFSC member groups | ETH Zurich, WFSC |
| Workshop 'Field to Fork: AI on our plates' at AI+X Summit | Oct 2023 | ETH Zurich | 50 | Lukas Roth, Sharon Wulff, Michael Buser | WFSC, ETH AI Center |
| Food Day @ETH<br>Precision nutrition workshop<br>Science-Policy interface workshop<br>Grasslands workshop<br>Plenary session and posters | Nov 2023 | ETH Zurich | <br>30<br>20<br>25<br>200 | Eva Galle, Hanna Lesme, Georg Aichinger, Eileen Ziehmann, Mélanie Surchat, Anik Thaler, Shun Hei Lee, Laura Nyström | WFSC, Grassland Sciences Group, Agroscope Forage Production and Grassland Systems Group, SVIAL, Swiss Food and Nutrition Valley, ETH Science-Policy Interface |
| FRIES Seminar (Food System Geography, Policy & Economics) | Dec 2023 | Online | 15 | Eileen Nchanji | AECP Group, Food Systems Economics and Policy Group, WFSC |
| **Total:** 16 events | | | **1'925 + Olma** | | |

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World Food System Center

| | |
|---|---|
| Content | Jeanne E. Tomaszewski |
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| Image Credits | p.2-3: ETH Zurich/Alessandro Della Bella, D-USYS, WFSCAN; p.4-5: WFSC, Karolina Rodriguez, SRF, Spirit of Bern, WFSC/Selina Hess; p.6 FAO, http://doi.org/10.4060/cc7088en-fig03; p.8: Travis Drake; p.9: WFSC; p.10-11: NICE project, Center members; p. 12: Melanie Surchat; p. 8-9: WFSC/ Alessandro Della Bella, Lukas Roth; p.16-17: WFSC, Leonhard Späth, Lukas Roth; p.18: WFSC; p.20-21: WFSC, WFSCAN; p.22: WFSC; p.24-25: Massimo Bagnani; ETH Zurich/smith-art, WFSC/ Selina Hess; p.26-27: SRF Club, WFSC. |
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