

ETH Zürich Foundation

Uplift

The impact of giving N° 22

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to protein extract**

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for new needs**

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Funding focus

Eating smarter

Nutritional advances



ETH Zürich / Markus Bertschi

Annette Oxenius

Vice President for Research ETH Zurich

Agriculture and food are closely linked to some of the world's most pressing challenges. With their greenhouse gas emissions surpassed only by those of the energy sector, the systems in these two industries are therefore in urgent need of climate-conscious and regenerative approaches.

Researchers at ETH are tackling the issues day by day, developing solutions that include drought-resistant crops, alternatives to animal proteins and advances in smart farming. Yet new technologies only have impact when they reach the market and gain acceptance – which is why ETH works in close partnership with industry at both local and global level.

On the following pages, you'll encounter innovations at every stage of their development: some still taking shape in ETH labs, others already out in the field or on supermarket shelves. Also crucial to the success of these stories were our valued donors.

Enjoy the read!

IMPRINT

Publisher ETH Zurich Foundation, 2026 **Editorial** Isabelle Vloemans, Andrea Zeller, Janine Braun, Lena Serck-Hanssen **Design, illustration** Kristina Milkovic

Photography Unless otherwise stated: Daniel Winkler **Printing** Linkgroup AG **Translation** Karen Oettli-Geddes

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Finger on the pulse

Curiosity, persistence and a keen sense of what's feasible – this is Anik Thaler, whose start-up Fabas is developing plant-based foods that include local hummus and protein extracts made from fava beans.

For Thaler, plant proteins hold enormous potential – not just for the food industry, but for agriculture, too. "During my studies, I saw how much plant-based products were gaining traction. But I missed the connection to Swiss farming. I wanted to eat locally," says the young entrepreneur, who studied agricultural sciences at ETH Zurich. What bothered her was the fact that many plant-based products relied on imported raw materials.

So she set out to change that. In 2021, together with a group of fellow students at ETH's Student Project House, she developed a hummus made from Swiss chickpeas – and, at just 21, founded Fabas. Alongside this, she attended an evening entrepreneurship course at ETH. The product struck a chord, first appearing in organic shops, then on the shelves of a major Swiss retailer.

What began as a gap-year project soon became a full-time job. The team evolved as well. "At first, Fabas ran alongside my studies. But once I decided to fully commit to the company, the team underwent a reconfiguration too." Today, Fabas consists of nine female employees – seven of them in food technology, many with ETH backgrounds.

New direction for greater impact

Hummus was followed by falafel and a burger. But in 2025, the founders made a stra-

tegic shift. "Around 60 per cent of people in Switzerland identify as flexitarians and want to eat more plant-based foods. For that to happen, we need a range of products that convincingly meet people's everyday needs and deliver in quality and taste," Thaler says. While intensive research has been conducted on dairy processing for decades, plant-based production often suffers from a lack of technological expertise. That's where Fabas comes in. Instead of developing its own end products, the company has now turned its attention to the value chain.

Working with the University of Applied Sciences in Sion, the team developed a gentle method for extracting protein from pulses. The resulting neutral-tasting protein extracts and pre-mixes from fava beans can be processed much like cow's milk – into yoghurt, ice cream, cream cheese or cream. "A glance at supermarket chillers shows how saturated the dairy market is," Thaler notes. "Plant-based alternatives, by contrast, still offer huge scope for innovation." Fabas' semi-finished products are therefore now targeted at dairies, enabling producers to develop new plant-based lines using existing infrastructure. The first products using Fabas extracts are already on the market. Meanwhile, the company is expanding production capacity in Germany, with the long-term aim of becoming one of Europe's leading suppliers in this space.



Attila Janes, «Schweizer Bauer» Magazin

A raw material with potential

"Harvesting the power of pulses" – for Thaler, the company's slogan is more than just a marketing tool. "Peas, beans and lentils fix nitrogen in the soil through their roots, so they can be grown without fertilisers. And pulses provide not just protein, but fibre too, which is essential for a healthy diet," explains the entrepreneur, whose hobbies include ultracycling and triathlon. Nevertheless, consumption in Switzerland remains at around two kilograms per person per year, which is well below recommended levels. Thaler is determined to change that. As co-founder and board member of the Swiss Pulse Association, she's pushing for more pulses on Swiss fields and plates.

She's also true to her values in her private life. Together with her partner, she recently took over a farm in eastern Switzerland via www.hofuebergabe.ch, with extensive grassland, 200 standard fruit trees and 33 dairy cows – and soon, their own fava beans. For its products, however, Fabas sources

raw materials through IP-Suisse, an organisation of around 18,000 farmers that coordinates the cultivation and marketing of agricultural produce. This allows the start-up to strengthen its ties to Swiss agriculture while ensuring stable supply chains for the quantities it requires.

Close ties with ETH

Thaler remains closely connected to ETH to this day, both in her exchanges with researchers working on projects in crop research and as a mentor for food start-ups at the Student Project House. "What's great about start-ups in the food sector is how quickly you can test the foods – unlike with an app or even a medicine," she says.

She's therefore strongly in favour of expanding the Student Project House to include a Food Lab (see p. 15). "Easy access to a food-safe environment and the right infrastructure can make all the difference for students with exciting ideas."

"For plant proteins to reach the plate, we need a range of options that deliver on quality and taste."

Pulses are not only nutritious, but they also improve soil fertility.



Feeding the next generation

By developing processes that transform foods, ETH assistant professor Patrick Rühls finds edible solutions for changing needs.



Freeze structuring changes the taste and texture of a raw material.

Your research field is food structure engineering – what does that involve?

PATRICK RÜHS – The aim of my research is to develop new processes that allow foods to be produced with improved nutritional profiles. In essence, many of the steps are similar to those in a home kitchen – just on a larger scale. We use techniques such as extrusion, where a dough-like mixture – not unlike pasta-making – is forced under pressure through a nozzle, or freeze structuring, which can create entirely new textures in food simply by freezing and thawing. We also apply traditional methods to new raw materials: for example fungal fermentation, familiar from Brie cheese or Indonesian tempeh.

Don't we already have enough wonderful foods?

People's needs are changing. There's currently a growing desire for more plant-based diets, or for foods that are particularly high in fibre or protein. Global warming is also altering growing seasons – and therefore the availability of raw materials – which is why alternatives to products such as chocolate and coffee are gaining importance. Sometimes, it's also about offering already excellent foods in a new, more appealing form. There are strong arguments, for example, for promoting the consumption of legumes, i.e. lentils, peas and beans. They're rich in fibre and protein and including them more in our diets would benefit the environment too. Yet many people dislike lentils; if a process existed that altered their texture and flavour to make them more attractive to lentil-haters, that would be a clear win. Other goals

include finding processes that use less energy or can be made more widely accessible. Freeze structuring, for example, could be one such democratisable technique: with this method, lentils – or a lentil-based protein dispersion – can be turned into a meat alternative using nothing more than a freezer.

There's a widespread belief that the less processed a food is, the better.

This view is too simplistic. Food processing is hugely important today: it not only makes food safe and nutritious, but also available and affordable. Not everyone has their own garden, and food needs to be preserved and distributed. Nor would anyone recommend eating raw chicken or raw green beans. The belligerent term "ultra-processed food" (UPF) makes no scientific sense. It often seems to be targeted at industrial production in particular. Yet a cake isn't automatically healthier just because you bake it yourself. Of course, processes should become smarter: just as we've come to recognise that whole wheat bread is preferable to white bread – because beneficial micronutrients are not removed from the flour – we're researching processes that require less pre-processing of raw materials. A soya bean should be processed as a whole, with all its components intact. This would improve nutritional quality and could also help defuse the often misleading debate around UPFs. Processing can make a difference – and that difference can be positive, as in fermentation, which improves nutrient availability.

How has the industry experience you gained at the ETH spin-off Planted benefitted your group?

At Planted, I spent four years working on a plant-based steak. I was able to follow the entire innovation cycle and learn how I, as a researcher, can help companies create better food. These years in the industry also gave me a clearer sense of the key challenges companies face and what they expect from future graduates.

"We're researching processes that require less pre-processing of raw materials. A soya bean should be processed as a whole."



In the lab where ETH spin-off Planted once started production, researchers working on new ideas include assistant professor Patrick Rühs along with former Excellence Scholar and now doctoral student Andrea Bach.

Your research group shares lab space with Alexander Mathys' group. Do you collaborate?

We complement each other very well: we focus on fungi, they on algae. From a nutritional standpoint, fungi and algae could make a fascinating combination. We don't operate in silos – we're happy when we find it's better to cover strategic areas together. Take extrusion, for example. Although the process has been around for 50 years, we still don't understand it in depth. With greater insight, the extrusion process could be adapted to the raw material, rather than the other way round, potentially eliminating certain processing steps altogether. Alongside Alexander Mathys'

lab, the ETH World Food System Center is also of great importance to us. It enables broader connections with the various disciplines, as well as with academic partners and industry.

From the lab back to the dining table: what do you like doing best in the kitchen? My hobby is baking sourdough bread, so our family of four usually eats bread I've baked myself.

Patrick Rühs' professorship was made possible by donations from Givaudan, Bühler and Nestlé.

Find out more:
fse.ethz.ch, worldfoodsystem.ethz.ch

Food for thought



In agriculture and food, too, sharp minds who have studied and conducted research at ETH Zurich are questioning the status quo. Some take the leap into entrepreneurship, either independently or supported by donors. A selection:

Catchfree: seafood made from plants

Fish and seafood without overfishing, bycatch or micro-plastics: Catchfree structures rice, mushrooms and soya into seafood, with a short ingredient list but rich in protein and omega-3. Available in selected restaurants.

Caterra: high-tech weeding robot

An autonomous robot removes weeds from crops using lasers – enabling scalable ecological farming. Operating day and night, and in all weathers, it offers a solution for the many farms struggling to find enough labour for weeding.

Digit Soil: for optimal fertilisation

This start-up enables farmers to accurately measure nitrogen release in their soils. Using biochemical measurements and weather data as a sound basis for decision-making, the result is a higher yield quality, reduced nitrate leaching and lower greenhouse gas emissions.

Tastelab: culinary delights driven by science

Dedicated to the future of food, this creative studio founded by astro-physicist Sue Tobler and computer scientist Remo Gisi may well be one of ETH's most unusual spin-offs. It offers a range of innovative gastronomy projects, catering and events at the intersection of science and culinary art.

Olexir: healthier fats from plants

Solid fats in foods and cosmetics contain high levels of saturated or trans fatty acids, which can pose health concerns. Olexir's technology uses plant proteins to transform liquid oils into solid structures.

Planted: meat alternatives

This ETH spin-off delivers sustainable plant-based proteins. Raw materials – such as peas, sunflower or soya – are grown by European farmers and processed into flour. Extrusion and fermentation create fibrous, juicy plant-based meat.

Terensis: harvest forecasts from space

This ETH spin-off uses satellite and weather data to predict crop yields and climate risks such as drought and frost – globally and around the clock. This helps producers and buyers in the food industry respond more quickly to price shocks.

Originating in the Student Project House
Funded by a Pioneer Fellowship



Find out more:

ethz-foundation.ch/en/sph

ethz-foundation.ch/en/pioneer-fellowship

For even more trailblazing start-ups

The Pioneer Fellowship programme funds outstanding researchers with entrepreneurial ambitions along the road to a market-ready product. Selected by a panel of experts, ten to fifteen Pioneer Fellowships are awarded every year from funding donated by foundations, companies and over 200 private individuals. ETH Zurich is looking to expand the programme so that even more young researchers can receive up to CHF 180 000, coaching opportunities and the chance to develop their research findings through to commercial application.

"Success carries responsibility"

As a professor at ETH Zurich and laboratory head at the Paul Scherrer Institute (PSI), Roger Schibli shapes radiopharmacy. In this conversation, he explains why he believes philanthropy is an expression of academic responsibility.

Radiopharmacy is a term rarely heard in everyday life. What defines this discipline, and what excites you about it?

ROGER SCHIBLI - In radiopharmacy, we couple targeting molecules with minute amounts of radioactivity. This creates radiopharmaceuticals that can either detect diseases within the body or treat them with precision. What's remarkable is that the molecule itself often remains the same; only the type of radioactivity determines whether it serves a diagnostic or therapeutic purpose. We call this interplay "theragnostics". It's a unique medical concept that continues to fascinate me.

Drug development is associated more with the pharmaceutical industry than universities. Why is radiopharmacy an exception?

Radiopharmaceutical agents pose major logistical challenges. Radioactive isotopes are short-lived, so drugs can't be mass-produced or stored. Instead, they must be manufactured fresh every day, often right in the hospital. These special demands have long made the field too complex and economically unattractive for industry. As a result, research and application remained largely academic – at least until recently.

What has changed?

Large clinical trials now show that radiopharmaceutical therapies are highly effective in treating advanced cancers and generally cause fewer side effects than conventional chemotherapy. Until now, they've mainly been used for patients who have exhausted all other treatment options. Increasingly, however, interest is turning to applying the therapies at an earlier stage and combining them with established cancer treatments. This raises promising options for patients as well as new research questions on topics like long-term side effects, optimised molecules and novel isotopes.

How do you experience the collaboration between ETH Zurich and PSI?

As a true win-win. PSI benefits from ETH's broad academic environment, and from access to talented students and international networks. ETH benefits from PSI's unique infrastructure and expertise. It's important to me to link both institutions in my research and teaching. My doctoral researchers and senior scientists, for example, work alternately at ETH and PSI.



“In my eyes, ETH and the ETH Foundation are institutions of trust. You can be sure where the money goes: into research, students and the future of the university.”

As a professor, you also train the next generation of scientists. How do you think the education system has changed in recent years?

It's become more demanding – for students and teachers alike. Information overload is vast; with AI it's exploding. It's now more important than ever that students must learn to think critically: to formulate problems, develop hypotheses and interpret results. That's why I still conduct oral exams. Those who've truly understood the connections can discuss, argue and make well-founded decisions – on the spot.

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I'd compare it to a generator. In radiopharmacy, this is a device that continuously produces daughter nuclides from a "mother nuclide" – which can then be used for diagnostics or therapy. ETH is like that for me: it trains and constantly unleashes new potential – knowledge, talent and ideas radiating far beyond the campus.

You also support ETH philanthropically. Why?

Because I believe that success carries responsibility. My research success owes much to ETH and PSI. So I want to give something back. In my eyes, ETH and the ETH Foundation are also institutions of trust. You can be sure where the money goes: into research, students and the future of the university.

Can you give an example?

Yes. The MedLab Fellowship, for instance: a research-oriented training programme at ETH for young medical doctors. Exchange between medicine and research is key

to solving problems arising from clinical practice. Programmes like MedLab build that bridge, and we need more of them.

What do you wish for the future of ETH?

More people who choose to support basic research through philanthropy. Private donations can provide support swiftly and unbureaucratically, enabling bold visions to take shape. Often, it's seemingly frivolous intellectual pursuits that later lead to genuine scientific breakthroughs – as in my own case, ultimately leading to the creation of Araris Biotech.



Promote visionary research:
ethz-foundation.ch/en/poly-fund

About

Roger Schibli studied chemistry at the University of Basel, where he also completed his doctorate. After a number of research assignments, ETH Zurich appointed him Assistant Professor in 2004, followed by Associate Professor in 2010 and Head of the Center for Radiopharmaceutical Sciences. Since 2019, he has served as Full Professor at ETH Zurich, developing radiolabelled compounds for targeted tumour diagnosis and therapy. He is also a co-founder of Araris Biotech, an ETH and PSI spin-off acquired by a Japanese pharmaceutical company in 2025.

Calling all food innovators and agripreneurs!

The ETH Student Project House is a true success story. With donor support, it's set to gain an additional innovation space dedicated to future-ready agricultural technologies, food processing methods and products: the ETH Food Lab.



MYDO Mushrooms

Image: The student project MYDO Mushrooms researches and cultivates lion's mane mushrooms as high-quality nutritional supplements and gourmet ingredients for the kitchen.



GreenState AG

- 16 Yasai, a company that grew out of the Student Project House, builds vertical farms for herbs and leafy greens, harnessing AI and automated processes. The plants are grown pesticide-free, with minimal resource use and short transport routes. Its Zurich farm now supplies more than 600 supermarkets.

The Student Project House (SPH) at ETH Zurich offers students creative spaces to experiment freely, build prototypes and develop an entrepreneurial mindset. Its two locations on the Campus Zentrum and Hönggerberg are home to coworking and maker spaces that offer round-the clock access to infrastructure, tools and devices such as 3D printers and laser cutters. Coaches work with students on their learning journey, helping them review processes, and workshops are held on practical topics such as presentation skills. A network of more than 50 experts from business and industry also provides support – including lawyers, marketing professionals and start-up founders – all of whom contribute pro bono.

Ambitious goals

The SPH is hugely popular among the student community. However, the food and agricultural disciplines have so far not had the benefit of a purpose-built lab environment. This is where the planned ETH Food Lab comes in. Complementing the existing workshops, the new state-of-the-art laboratory will form the heart of a seamless food innovation pipeline: from initial ideation through technical prototyping in the lab to subsequent pilot production, it will be able to deliver market-ready solutions for resource-conscious and climate-friendly food systems. Building on ETH's outstanding expertise in this field, the ETH Food Lab aims to become a globally leading experimental space for students.

After a five-year construction phase, the lab is expected to be used by around 100 project teams each year. Experience shows that students who pursue an SPH project alongside their demanding degree programmes are among the highest performing in Switzerland. What's more, many of these projects go on to become spin-offs. Each year, nearly a quarter of all ETH spin-off and start-up companies emerge from SPH projects – in 2025, this amounted to 11 out of a total of 46. Expanding the SPH therefore not only enables students to develop skills and launch new companies but ultimately strengthens Switzerland's position as a business hub too.

Embedded in a dynamic ecosystem

ETH's academic environment is closely connected with a wide range of stakeholders, including companies in the food sector and related industries, the Zurich University of Applied Sciences (ZHAW) and the Swiss Food & Nutrition Valley in Kempthal. EPFL in Lausanne and innovation network Swiss Food Research are also key partners.

Synergies are emerging with a food coworking space in Zurich that hosts exciting projects in gastronomy and food production. Plans are in place to share infrastructure, for example in coffee roasting and brewing technology. In future, spin-offs from the ETH Food Lab will be able to continue their work or production there, providing a seamless next step beyond ETH.

Making great things happen – together

The funding required for the planned five-year construction totals around CHF 2.6 million. ETH will contribute in the form of premises and furnishings. The patron of both the new ETH Food Lab and the SPH as a whole is Rector Günther Dissertori. The SPH is led by Lucie Rejman, who completed her doctorate in food process

engineering at ETH and co-founded a food-sector start-up. Donors who wish to work with ETH to advance innovative solutions in areas such as plant-based meat alternatives, robot- and drone-assisted precision agriculture or circular food systems are warmly invited to get in touch with the ETH Foundation.

 Find out more:
ethz-foundation.ch/en/sph

“The Student Project House enables students from a wide range of disciplines to work on projects together and develop strengths like systems thinking and interpersonal competence. I’m constantly impressed by the results that emerge.”



Günther Dissertori
Rector of ETH Zurich



Smart farming: With their weeding robot, the young founders of Cattera are modernising agricultural practice (see p. 10).

Your support

Whether it's in energy and climate, digitalisation or public health – science and technological innovation offer tremendous opportunities for creating a more resilient and sustainable society. What makes the difference is excellent research and teaching, strong partnerships – and you.

With an unrestricted donation to the Poly Fund, you can help bring visionary ideas to life!



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