zukunftsInstitut

HANNI RÜTZLER

FOODREPORT 2023

Lebensmittel Zeitung

foodservice

gvpraxis

Publisher
Zukunftsinstitut GmbH
Kaiserstraße 53, 60329 Frankfurt a. M.
Tel. + 49 69 26 48 489-0, Fax: -20
info@zukunftsinstitut.de

Executive management
Harry Gatterer

Published in cooperation with
Lebensmittel Zeitung, foodservice
and gv-praxis.

Contact
Janine Seitz, Zukunftsinstitut
Tel. +49 69 26 48 489-0, Fax: -20
info@zukunftsinstitut.de

Hilke Waas, Lebensmittel Zeitung
Tel. +49 69 75 95-19 57, Fax: -19 50
waas@lebensmittelzeitung.net

Authors
Hanni Rützler, Wolfgang Reiter

Project management
Janine Seitz

Editorial staff
Ramona Fricke, Lena Papasabbas, Janine Seitz

Editorial assistance
Funda Bakan, Nina Brückner, Courtney Gerber,
Jonas Höhn, Nural Janho, Ella Kaltenegger,
Jan Langlitz, Nathalie Schroeder,
Tessa van Waard

Translation
Deman Übersetzungen

Design and Typesetting
Benedikt Eisenhardt Kommunikationsdesign

Cover images
Piotr – stock.adobe.com

CONTENTS

Hanni Rützler

PORTRAIT

Hanni Rützler has been analysing the changes in our food culture for over 25 years. On behalf of the Zukunftsinstitut she has been studying the food sector as part of the institute's annual Food Report. The trained nutritionist and health psychologist began describing the main nutritional trends for the Zukunftsinstitut almost 20 years ago. She is considered the most important voice in the polyphony of trend scouts and food marketing agencies. Her many years of experience and keen instinct for emerging trends allow her to distinguish between short-term hypes and fashions, and genuine long-term trends. This of course involves much more than desk work; she is also in dialogue with representatives of renowned teaching and research institutes, players from the food and beverage sector, professionals and practitioners from the food production industry, agriculture, the restaurant trade and retail as well as with food visionaries who do not calculate the possible, but rather imagine what is conceivable.

Hanni Rützler is Europe's leading food trend researcher. In addition to her work as an author, she holds inspiring lectures and offers systemic consulting formats that provide companies and organisations with practical solutions. She drew worldwide attention with the legendary tasting of the first burger patty made from cultured meat in 2013. At the invitation of Mark Post, the Dutch cultured meat pioneer, she was the first woman to taste this novel meat. What caused a sensation around the globe at the time is now considered a cornerstone of the world's future source of alternative protein; in this edition Hanni Rützler devotes a detailed chapter to this topic.

This is the tenth edition of the Food Report, which is considered a trailblazing publication and is used by retailers, the food service industry and producers to prepare for the future. Hanni Rützler has cultural scientist Wolfgang Reiter at her side, a kindred spirit with whom she authors the Food Report. And when not involved in research, they indulge in culinary delights at their favourite Viennese restaurant at Yppenplatz, where chef Raetus Wetter inspires them with Mediterranean delicacies.

Image: Luiza-Lucia Puiu, Location: Restaurant Wetter, Vienna

Intro

FOOD REPORT 2023

After two reports dominated by the pandemic, this year's edition was marked by the hope that the food & beverage industry would undergo a momentum shift. With energy and anticipation we started creating the new Food Report 2023 and put our heart and soul into its creative design – after all, this is our 10-year anniversary!

The food system in the era of multiple crises

After we got off to a flying start, Russia invaded Ukraine just when we were preparing this year's themes. Now nothing is how it used to be. Suddenly we are confronted with a food system shaken to the core by the war, the prospect of having to live with rising prices in Europe, food shortages and even famine in economically weaker countries. The outlook for the future is anything but rosy after the health crisis. Future resilience is more important than ever. Much of what was triggered by the pandemic will further solidify. In last year's Food Report, we discussed the need for companies to be robust, resilient and adaptable as we deal with multiple crises. We are particularly thinking of the climate crisis; which, although it is repeatedly overshadowed by new crises, can really no longer be overlooked or ignored.

Explaining the dynamics of food trends

We could take a nostalgic look back and say "everything was better in the past". Or we could congratulate ourselves, because many of the developments we described in the last nine Food Reports are still valid today. And make this about the tops and flops of past years. But it is not about that. Anyone who understands the dynamics of food trends knows that they are in constant flux, are weakened or strengthened by external influences, reach a critical mass or get lost in the mainstream. For us, it is all about harnessing food trends and turning them into a tool that helps the industry make better decisions for the future. This is also why we strive to make the complex interrelationships of food trends visible and understandable. The food trend map has also evolved

over the years, and for this edition we have found a new way of representing these interrelationships to make them even easier to map and understand.

The future belongs to sustainability

As always, we take a look at the latest food trends. The new trends, as well as the focus on meat and the excursion into the future of retail, have to be understood against the background of neo-ecology, the most important megatrend of our time (cf. Zukunftsinstitut 2019). Sustainability is a central aspect of neo-ecology and a key concept in the food sector, encompassing environmental, social and economic components. It has become somewhat of a truism to say that the battle for a better future is decided on our plates. Established structures of the food system thus need to be questioned, changed and, where necessary, disrupted in order to enable sustainable development. In the meat industry, this revolution is speeding up: A change in eating culture that no longer focuses on meat as the dominant component in meals, and the availability of many tasty vegetarian and vegan dishes, have set off a race among food producers for meat substitutes.

Conscious creating: Innovation needs irritation

The food retail sector is a key player in the transition to greater sustainability. The formula is quite simple in theory: make it as easy as possible for consumers to make climate- and eco-conscious decisions. The sustainability visions for supermarkets that we describe in the chapter on retail point out ways in which food retailers can play a key role in making our economies climate-neutral and circular. Alongside description, aesthetics are a powerful communication tool to help broaden our perspective and horizons. For this we managed to sign up the social design studio EOOS NEXT from Vienna, which took a critical look at the food system through a design intervention. EOOS NEXT subjected selected supermarket products to a speculative design process and created objects which, thanks to the skills of photographer Luiza-Lucia Puiu, were perfectly showcased in a supermarket. The results of the SUPERPACKED design intervention can be seen in the photo series starting on page 124. True to the motto: Innovation needs irritation.

Decisions for the future of the planet

The thought-provoking ideas, outlooks and visions in the tenth Food Report are designed to encourage you to take stock. We have to understand which patterns, structures and ways of acting are still appropriate in a time when we are trying to learn to live with continual crises. We have to decide what is truly important. Because every decision you make today is also a decision for the future. It is therefore important to make decisions that make sense for you and are likely to bring success. And decisions that are right for the planet.

The contents at a glance

FOOD TRENDS 2023

Overview

Navigating turbulent times with food trends
Food trends are a basic tool for many players in the food industry. The food sectors are increasingly looking for roadmaps for the future, assistance for navigation or at least orientation to find the appropriate path in an increasingly complex environment. Which food trends you follow to be successful as an entrepreneur depends on your inner drive.

New Glocal

The reorganisation of the global food trade
Multiple crises and their impacts call for a re-regionalisation and reorientation of the globalised food system. Regional agricultural structures, shorter and transparent supply chains and a new focus on domestic markets are important steps towards a more resilient and sustainable global food supply.

Veganising Recipes

Classic dishes in a new guise
Vegan versions of traditional dishes will become part of our eating culture in the future. In addition to new high-tech meat and fish substitutes, delicious meat-free adaptations of our favourite dishes without long lists of ingredients are now also available.

Regenerative Food

Sustainable food beyond organic
Regenerative food focuses on soil regeneration and biodiversity. It is the next step in the agribusiness to bring the planet back to health. Top restaurateurs value this type of food production, and large food companies also have their eye on the movement.

Theme focuses

Meat

The diverse future of meat consumption
Meat is losing its role as the leading product of our eating culture – certainly in the visions of innovative food technologists, investors and in the vegan discourse on "proper" nutrition. Plant-based food has become one of the most important food trends of our time. In addition to plant-based products, alternatives increasingly similar in taste and texture to meat and fish are emerging. Alt-protein and cell-cultured food are the food industry's new buzzwords.

Fusion

The culinary globalisation of our everyday life
While the trend towards more regionality and locality continues to strengthen with regard to the ingredients for our dishes, we are seeing ever greater internationalisation of the dishes themselves. A new appetite for fusing and blending cuisines and culinary traditions is emerging alongside the integration of "foreign" cuisines and exotic foods. Many people love experimenting with ingredients and preparation methods, and this is rapidly spreading as a result of new popular recipes being presented on social media platforms. Fusion is the new normal!

Industry Insight

RETAIL

Retail Visions

An awareness for sustainability is changing the world of food retailing
The contradiction is striking: consumers choose food based on criteria of sustainability and social justice. They also want their food to be regional, organic, fair and livestock-friendly, if possible. However, everyday purchasing habits are often quite different. Price, convenience and the range of products available in the supermarkets dictate people's actual choices. In the future, supermarket product ranges will have to take into account the wishes and values of a growing number of people who want to shop more sustainably and fairly.

FOOD TRENDS

Overview

New glocal

Veganising recipes

Regenerative food

FOOD TRENDS

Overview

Navigating turbulent times with food trends

Over the past ten years, food trends have become the basic tool for many actors in the food industry: in executive offices as well as in departments of product development and innovation, in international corporations, SMEs and start-ups, in the gastronomy and for committed farmers. And of course in marketing departments and agencies providing advice on PR and advertising campaigns. This indicates that food industries are increasingly in search of suitable roadmaps for the future, navigation guidance or at least maps for orientation to find an appropriate path in an increasingly complex environment.

Orientation in an increasingly complex world

In times of ongoing and worsening crises and the associated uncertainty, we have been asked whether orientation assistance such as the food trend map (see page 20) is still valid or whether it needs to be continually updated. Are the potential paths we describe based on trends still up to date and realistic? Are not the food developments already wastepaper due to the pandemic-related business disruptions, the geopolitical and economic upheavals that the war in Ukraine is currently triggering? It appears that the future we felt we could plan and strive for has gone missing. The future we imagined for decades in a meaningful portrayal of our society and economy, the social narrative about progress, innovation and growing prosperity. A future which spoke of the positive effects of global trade and how this is reflected in the rising living standards of developing and emerging countries. To put it bluntly: Do we have to put our idea of a better world in the future on hold?

Rising energy prices, threats of shortages of essential raw materials for industry and agriculture, migration movements are only some of the effects the war in Ukraine has on Europe. These newly emerging realities are a throwback to the present. On top of that the COVID-19 pandemic carries on while the climate crisis continues to worsen. Meanwhile, the constant state of crisis nourishes the longing for an "old normal", which, however, irretrievably ended with the start of the pandemic if not even before.

A plannable comeback for the future?

What are our possibilities? "Can one," as the Austrian writer Robert Menasse said, "plan a comeback of the future?" (Menasse 2017, p. 177). In his 2017 novel "The Capital", the EU specialist and winner of the German Book Prize called for another opportunity for the European idea, which could lead us out of the crisis of a crumbling EU. But what exactly is needed to revitalise our shared social visions for the future?

First we need to realise that all the decisions we make, all the tasks we now set ourselves, are not decisions only made for the present, but have a long lasting effect on our future. Whether planned or unplanned, they determine what tomorrow will bring. To shape a reimagined future requires the courage to take stock; "to carefully sift through the inventory of our way of life, to consider piece by piece what can be thrown away because it is outdated and what will be needed in the future" (von Thadden 2021). This is how the French philosopher Corine Pelluchon put it in an interview in spring 2021 in reference to what we could learn from the pandemic for the future. With such an inventory, we could set about a "comeback of the future" under new framework conditions. In short: we can begin to think about what is really important to us.

"People don't buy what you do. They buy why you do it"– ever since leadership expert Simon Sinek urged us in his bestseller to first ask about the Why, people started searching for their purpose in companies (cf. Sinek 2009). Clarifying the Why is essential for every individual, every organisation and every society. Despite all the unpredictable coincidences on the way, the future does not simply approach us. It emerges from our thoughts and actions, which in turn are based on our values and deeds. In times of uncertainty and confusion, questions about our motivation, values and purpose become more important. "Who am I, what do I stand for, why do I do what I do and what am I actually doing?" These questions are not only asked reflecting about one's own identity, these are also leading questions for entrepreneurial behaviour.

The knowledge of one's own drive as well as the acknowledgement of the values which the company stands for are essential for an effective confrontation with the outside world. Which in sight of current crises might have to be revalued. For the food and catering industry, including retail and agriculture, food trends reflect this "outside world". Trend research observes companies from the outside and can only offer useful guidance if the internal question of "why" has been previously perceived and defined. Based on food trends, researchers attempt to describe and analyse the transformation of our eating

A successful food trend orientation depends greatly on the entrepreneurs themselves and their “inner drive”.

culture and food system. However, it is the internal drive, the Why, that keeps people grounded and in turn makes it sensible and commercially promising for businesses to base their decisions on food trend analyses. In order to be able to select promising paths for a company from a variety of trends a base has to be created beforehand.

But what makes food trends a useful tool for understanding social change? They provide orientation even when they may appear astonishingly offbeat. Hence it is firstly important to realise that our understanding of trends differs from positivistic, statistically based trend definitions commonly found in economics and market research. A trend in an economic sense is a changing development that can be measured and continues in the same direction. Our approach, on the contrary, can be described as hermeneutic. Our approach is not solely interested in what develops and how, but above all why. This Why, however, cannot be ascertained by statistical methods, it has to be understood.

Separate the signal from the noise

Trend research essentially consists of recognising the “weak signals” at the beginning of a trend and differentiating them from the media noise that assumes a trend is present in everything new. Trend research also involves reading socio-cultural shifts and placing them in an overall context. In other words, the core of trend research fundamentally is cultural science. It is no “phenomenology of the new” merely describing individual products and innovations but rather it traces the origins of social change processes.

Looking back, it is apparent that many of the trends we have identified since the appearance of the first Food Report 2014 prove to be useful tools for the necessary inventory spoken of by Corine Pelluchon. From these tools answers and proposals for solutions to problems emerge that are only really becoming virulent due to the pandemic among other things, as well as the anticipated consequences of the war in Ukraine and the associated geopolitical and economic upheaval. Unlike product

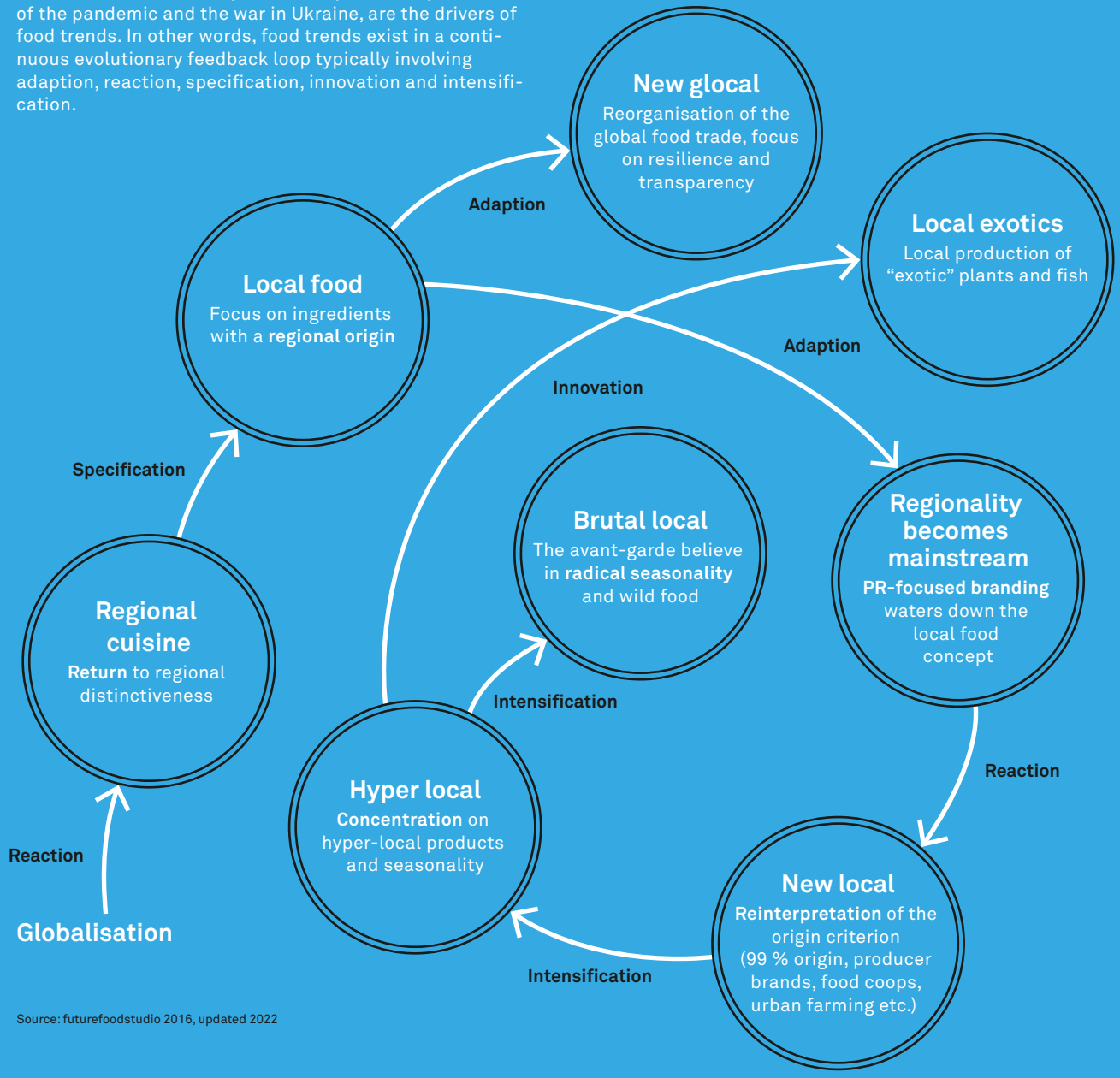
> “Consumers will always be able to tell you their problems, but they aren’t always able to imagine the best solutions.”
>
> — Mike Lee, co-founder and co-CEO of Alpha Food Labs

trends, food trends are frequently not directly consumer oriented. Especially in the early development phases, they offer solutions that consumers are not immediately expecting. A good example of this is “regenerative food”, a trend that only recently germinated in a small agricultural niche: it concerns a method of production presently unknown to consumers. However, it offers answers to the problems of production of primary agricultural products made worse by the climate crisis and thus ultimately also meets the consumer’s demand for tasty, sustainable and healthy food (see page 33). “New glocal” is a trend gaining momentum due to the threatening supply crisis caused by the war. However, the first signs were recognisable long before the conflict started (see page 23).

Food trends fulfil not only existing needs and wishes or reflect the values of consumers. They go beyond them; they “explode”, expanding and propelling them forwards. As a consequence, food trends do not develop linearly. They are influenced by continual changes, provoke counter trends and, in the ideal case, come up with innovative adaptations when stimulated by change. The development of the “local food” trend, for example, clearly illustrates these dynamics.

The development and differentiation of local food trends

Food trends are not a statistical phenomenon; they continually develop and become more differentiated. Megatrends such as globalisation, individualisation, urbanisation and security, the latter particularly as a result of the pandemic and the war in Ukraine, are the drivers of food trends. In other words, food trends exist in a continuous evolutionary feedback loop typically involving adaption, reaction, specification, innovation and intensification.



Source: futurefoodstudio 2016, updated 2022

Food trends differ from development trends, which can just be descriptively named.

Qualities of food trend research

Requirements to identify and classify these trend adaptations entail consistent monitoring of specific changes and regular exchanges of information with other actors along the entire food chain as well as input from university research and carefully conducted studies of the start-up scene. To be more precise, it needs analyses of market developments, consumer statistics, opinion surveys and meta-analyses of industry-specific trend reports. However, these analyses always require critical evaluation, because the overwhelming proportion of these reports are based on contract research for companies involved in production, retail (including delivery services), national marketing agencies, consumer protection bodies, consumer groups or lobbying and consulting organisations.

Crucial for the quality of trend research is the correct linking of isolated trend observations and collections of data: classifying emerging changes and adjusting them differently, sometimes even against public perception. Last but not least, specific trends need a name to gain them some initial visibility. Once there is a name for a phenomenon, people can talk about it. Trend research is in essence an exercise in translation from society into commerce. As soon as companies understand social change and how it articulates itself as a food trend within their industry, they have a basis on which to find decisions for the future.

At first glance, the diversity of the trends we identify and describe might make it difficult to understand them in a way that guides our actions. Viewed from a metaperspective however, thematic focuses single out from the diversity of trends. We make these more readily visible in our food trend map using corresponding clusters. Metaphorically speaking: clusters are the main roads along which companies can move in order to make the decisions required to ensure their fitness for the future following their inner drive, to position their products and services within a larger whole, to reflect on their own development processes and set new strategic focuses.

Companies that not only tolerate change but also actively shape this shift to a new, better normality will emerge strengthened from crises and be set up more resiliently for future social changes.

Food trends …

… give answers to current problems related to our diet or food production, i.e. offer solutions or present viable proposals for solutions and worthwhile alternatives.

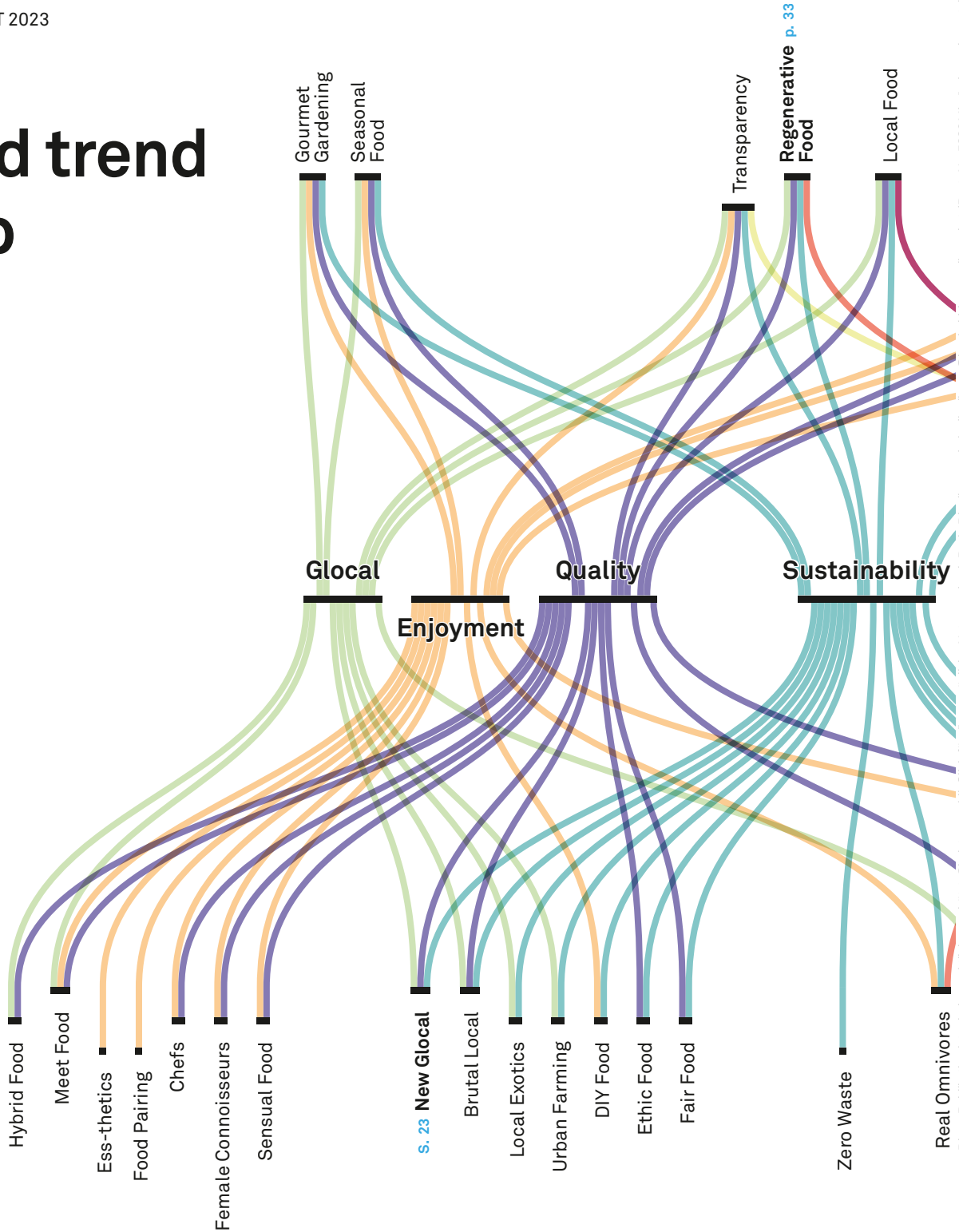
… reflect culture-specific yearnings, wishes and needs, but even go beyond them: not all food trends are consumer driven.

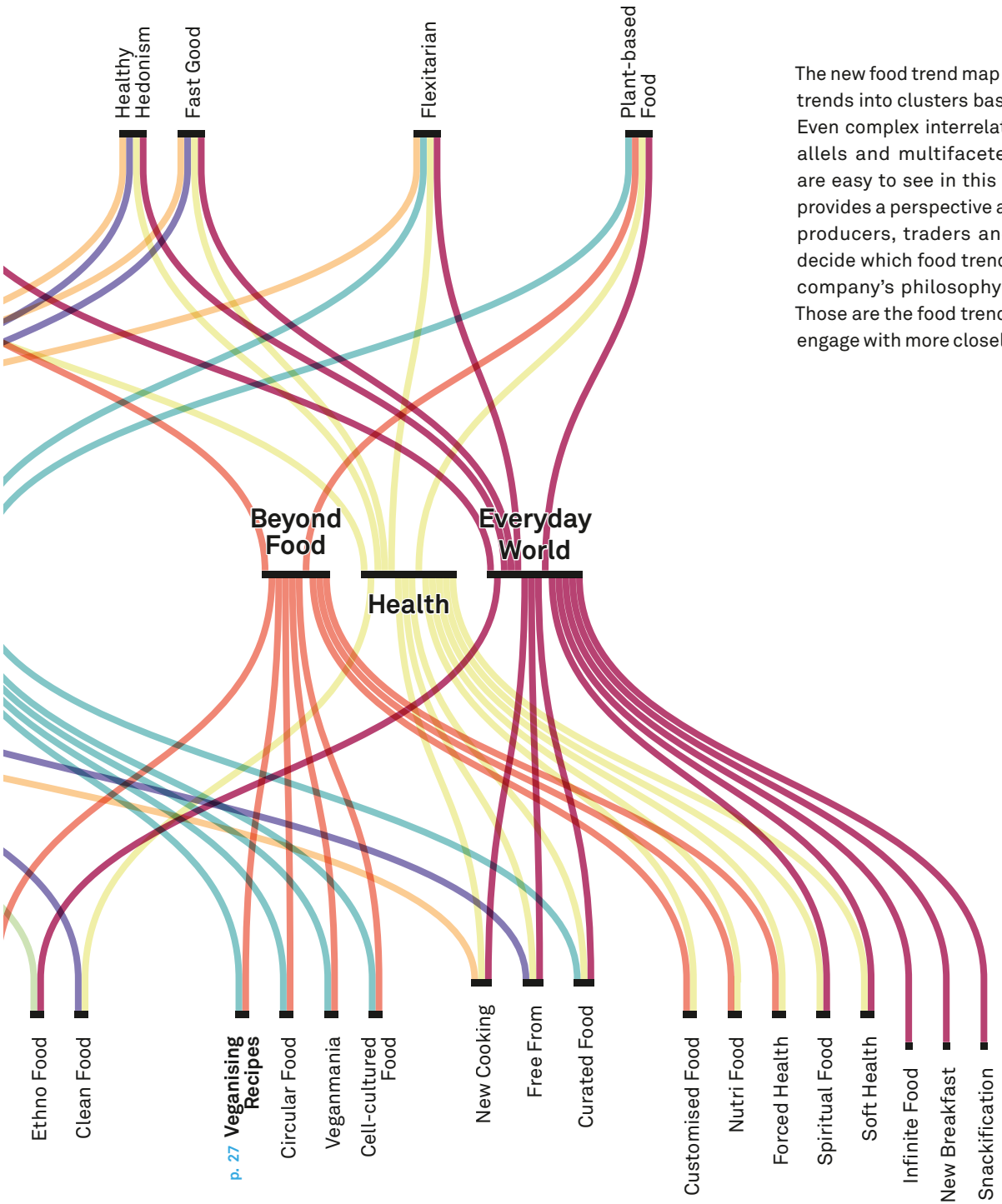
… stand for certain values, are points of reference for identification processes and therefore offer navigational guidance for our daily eating decisions and the selection of our food, including strategic decisions and conceptual orientation of companies involved in food production, trade and gastronomy.

… have a durability of five to ten years, are not static but dynamic, i.e. they change and develop further.

… differ from social megatrends, are not ubiquitous, do not influence everyone nor include every level of society, not even every food sector. On the contrary, they address various target groups and are carried along by a wide range of different actors. For companies, food trends are not operating instructions that should simply be followed, but meaningful sources of inspiration to ensure they remain fit for the future.

Food trend map





The new food trend map bundles many trends into clusters based on themes. Even complex interrelationships, parallels and multifaceted influences are easy to see in this way. The map provides a perspective and helps food producers, traders and caterers to decide which food trends match their company's philosophy most closely. Those are the food trends they should engage with more closely in the future.

FOOD TRENDS

New glocal

The reorganisation of the global food trade

Multiple crises and their effects call for a re-regionalisation and new direction for the globalised food system. Regional farming structures, shorter and transparent supply chains and a new focus on national markets are important steps towards more resilience and sustainability in the worldwide food supply.

The pandemic has already dealt a massive blow to global trade and the just-in-time supply chains in the food sector, while further fuelling the climate activists' long-standing criticism of global sourcing. The Russian invasion of Ukraine has put yet another damper on the often questionable advance of the globalised food industry. The established model of shipping food and animal feed around the world taking advantage of differences in economic cycles, growth and inflation, which involves huge amounts of greenhouse gas emissions and puts great cost and performance pressure on local producers, is beginning to crumble.

No one has yet been able to predict what long-term consequences the widespread shortfall of important agricultural products from the "granary of Europe" will have. However, it is certain that proponents of a resilient farming and food economy are now attracting more attention. It has become clear that new supply chains need to be set up and the European agricultural industry needs to become more geared to the internal market. By taking this new direction, the industry would also be more aligned with the wishes of a majority of consumers, who, even before the crisis, have advocated for more regional products, transparent supply chains, labels of origin and for the support of domestic producers.

App for more regionality in the supermarket

BEST PRACTICE: HIER FOODS

Supermarkets are stocking an increasing range of regional foods produced on local farms. Founding duo Lara Hämmerle and Mark Jäger established the food-tech start-up "Hier Foods" with the aim of simplifying the local supply chain and connecting food suppliers and merchants in the region with one another. Using the digital platform Hier Foods' retailers can place orders and receive digital delivery bills and invoices from even small, non-digitized suppliers via industry-standard EDI messages. Workflows at the interface of food merchants and local suppliers are designed to be more efficient, while the costs for ordering by email or telephone are reduced. As a result, the digitalisation of the food trade is driven forward and the range of regional foods in the supermarkets expanded.

hier.in

Working hub for a neighbourly food system

BEST PRACTICE: THE REDD

A place for connecting and supporting local food producers, companies and consumers in Portland, Oregon, "The Redd" opened its doors in 2017 with the aim of reforming the regional food business. The Redd offers smaller producers flexible working space, storage, packing and delivery options. The provided infrastructure and logistics facilities promote and simplify the sale and distribution of local products and enable cooperation with larger trading partners. The local supermarket chain "New Seasons Market", for example, purchases many products from the regional suppliers who congregate in The Redd. They are able to supply the supermarket while saving costs and greenhouse gas emissions.

reddonsalmon.com

New glocal is not only the answer to the massive upheaval in the globalised food system. Dynamised by the war, the food trend, which reflects the wish for a new, more sensible ratio of locally produced to globally imported food, will develop into guidelines fit for the future of the food industry. New glocal considers local and global aspects aside from lending them a new hierarchy. Not lower price but regional availability will become the primary criterion for deciding whether food should be imported or not. In situations in which food trade relies on international imports, the rules of the game will gradually change: more transparency along the whole supply chain, concerted cooperation with Fair-Trade producers and agricultural businesses that have committed themselves to ecological or regenerative production methods.

Trend prediction

The trend's movement towards glocalisation is driven forward by strong dynamics: the ecological consequences of a reckless globalised food industry are increasingly finding their way into public consciousness. The first shortfalls and scarcities in pandemic times have already shown the dependencies of globalised supply chains and their fragility. Geopolitical crises then drew more disturbing attention to the vulnerability of the system. New glocal will be no passing trend, but a harbinger of the next evolutionary stage in global food production in which a new focus on regionality and sustainable farming with resilient restrictions on international and global structures will prevail. Gradually, this will also lead to a reorientation of the assortment available in supermarkets and an expansion of international direct trading.

FOOD TRENDS

Veganising recipes

Traditional dishes in a new guise

Traditional dishes reinterpreted as vegan will be a natural part of our eating culture in future. As well as new high-tech imitations of meat and fish, it will star vegan adaptations of our favourite meals, without resorting to complicated lists of ingredients.

Almost every cuisine in the world includes dishes that have always been vegan. Indeed, the Austrian cookbook author Katharina Seiser has written two bestsellers on the subject. However, many people socialised in omnivorous eating cultures who wish to avoid food derived from animals in their diets find it difficult to follow a balanced and diverse meal plan. One reason is that an overwhelming proportion of traditional recipes that characterise German, Swiss and Austrian cuisine are based on foods of animal origin – meat and sausage just as eggs, milk and cheese.

The food industry is not the only one reacting to this with the creation of increasingly sophisticated substitute products (see the theme focus Meat, page 27) to "veganise" traditional dishes. On the cookbook market and countless recipe platforms, instructions on how to prepare traditional dishes "animal-free" are appearing. It is not necessary to rely exclusively on high-tech substitute products. Dishes can also be adapted convincingly in terms of flavour using natural ingredients, such as fungi, herbs, pulses, algae etc. This is easier in some recipes, for example where butter can be replaced with vegetable oils, but in others adaptation can be done only by making sensory compromises. Above all, recipes containing fish, meat, sausage or cheese need to be adapted convincingly so that the food tradition can be continued in culinary terms without the use of animal products. Creative cooks, such as those in the SevenCooks team, succeed in making interesting dishes that even taste better than meals

> “One does not have to live vegan to enjoy purely plant-based meals several times a week and of course eat really well.”
>
> — Katharina Seiser, cook book author and journalist (Fensl 2015)

with industrially produced imitations (sevencooks.com). A good example of this is “Aubergine Matjes” (Eggplant matie), which is a vegan interpretation of the North German classic.

Flour-based dishes and baked goods present a further challenge because most doughs are prepared with eggs. However, the list of egg alternatives is continually lengthening. They are usually in the form of powders consisting of a mixture of lupin flour, tapioca and potato or maize starch. Most of these products are whisked with a little water and can be used instead of egg in various recipes. Apple purée, or very ripe bananas mashed with a fork to form a purée, is suitable for binding and a source of moisture in the dough. Aquafaba, the liquid leftover from cooking chickpeas, is an alternative to beaten egg white and allows dessert classics such as mousse au chocolat to be veganised. Many of these new dishes will become an everyday part of our eating culture.

Image: Migros-Genossenschafts-Bund

The country needs new eggs

BEST PRACTICE: EAT JUST INC., GREENFORCE, ELSA

To enjoy an animal-free scrambled egg for breakfast or make an egg salad for the evening meal requires complex substitute products that are not easy to create in the domestic kitchen. A plant-based "liquid egg" made from mung beans by the Californian start-up "Just", which received approval for the European market at the end of 2021, will shortly be manufactured at a production centre in Germany. From the middle of 2022, supermarkets will stock a vegan "liquid egg" from the German start-up "Greenforce". It is based on broad beans and intended for omelettes and scrambled eggs. For their egg salads in future, consumers can call on the substitute "boiled" egg produced by the Swiss Migros manufacturing subsidiary Elsa: "The Boiled" first appeared on the shelves of the Swiss cooperative federation's retail stores at the beginning of this year.

ju.st, greenforce.com, migros.ch

Image: Eat Just Inc.

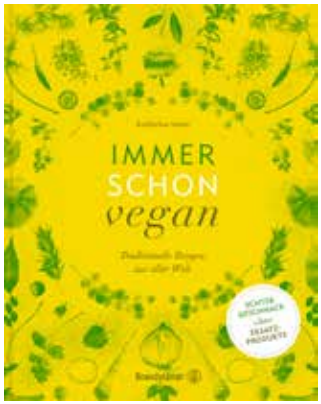


Image: Brandstätter Verlag

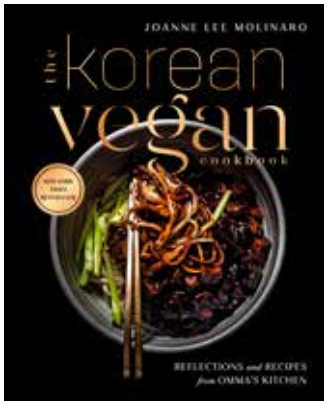


Image: Penguin Random House

Animal-free cooking without substitute products

BEST PRACTICE: "IMMER SCHON VEGAN" (ALWAYS BEEN VEGAN) BY KATHARINA SEISER

Instead of veganising traditional recipes, Austrian cookbook author Katharina Seiser took a different approach and collected traditional recipes that had always been vegan for her book "Immer schon vegan". With great success: the collection brings together 70 tasty, purely plant-based recipes from more than 20 countries. From Lebanese bread salad to Turkish leek and carrot vegetables, sweet-and-sour Indian tomato soup to crunchy Vietnamese lemongrass tofu right up to Italian grape cakes. The book, now in its tenth edition, was joined in 2020 by "Immer wieder vegan" (Vegan again and again), which continues the theme with many other substitute product-free recipes.

brandstaetterverlag.com, esskultur.at

The Korean Vegan TikTok star

BEST PRACTICE: JOANNE LEE MOLINARO

Joanne Lee Molinaro is a TikTok superstar and is cooking her way into the hearts of millions of foodies all over the world with her veganisation of traditional Korean recipes. The US-American with North Korean roots started his food blog in 2016 and, since the lockdowns due to COVID-19 in 2020, has also posted his recipes on TikTok (@thekoreanvegan). Out of this emerged his first cookbook, "The Korean Vegan", which was selected by The New York Times and The New Yorker as one of the best cookbooks of 2021.

thekoreanvegan.com

Trend prediction

Vegan alternatives of certain traditional dishes will become standard in our culinary repertoires. Just as chili sin carne has become as well known as chili con carne, there will be similarly successful equivalent alternatives to other classics from a wide range of cuisines. From meatballs or kimchi right up to cabbage roulade, some promising vegan versions are already emerging on recipe forums and blogs around the world. Not all vegan adaptations of well-known dishes or ingredients are convincing by any means. However, competition to create the taste experience that most closely resembles or even outperforms the original is already in full swing and will enrich us with further substitute products, cookbooks, kitchen utensils and creative recipe ideas over the coming years. After all, we are nowhere near peak veganisation yet.

FOOD TRENDS

Regenerative food

Sustainable food can be more than merely organic

Regenerative food focuses on soil regeneration and biodiversity. It is the next step for agriculture in shaping a healthier planet. Leading gastronomes value this form of food production and even large food companies are already taking note of the regenerative agriculture movement.

The way in which we produce food today is a significant cause for climate change and the loss of biodiversity. Unlike lifestyle diets occasionally suggest, sustainable diets do not end with the question of what we eat. The question of how our food is produced plays a crucial role. Even plant-based food or ingredients for vegan dishes can have a negative impact in terms of energy and sustainability if those are grown in a non-regenerative way which consumes too much water or reduces the amount of humus in the soil.

However, regenerative food production, even including extensive animal husbandry, can reduce greenhouse gas emissions by becoming less dependent on artificial fertilisers and by creating healthy soils rich in organic substances and greater microbial diversity. Healthy soils contribute to recreating the natural carbon cycle. They also increase the soil's ability to sequester carbon, which combats climate change. Healthy soils withstand erosion and compaction better and are able to store water, which mitigates the effects of drought. They can absorb large amounts of water, which reduces the risk of flooding.

Regenerative methods are adaptable to different local conditions in all sorts of ways and go beyond typical organic farming operations. Various plant species and cover crops can protect the soil. Agroforestry, the planting of trees around or between useful plants or on pastures, has the same effect. Rotational grazing, pasture on which cattle, sheep and goats graze for only a certain amount of

time, allows pasture plants and soil to recuperate, and is a regenerative farming practice. These methods result in farmland similar to natural ecosystems such as woods and native grassland, while offering a habitat for a multitude of different organisms. Through the reduction of the need for artificial fertilisers and pesticides, the pollinators and microbes so indispensable for the maintenance of healthy ecosystems can thrive in the soil.

Regenerative food, the production of food in accordance with the criteria of regenerative agriculture, offers a far-sighted answer to the threat of climate change aside from fostering diversity of planted species human diet is based on. Therefore, this agricultural method provides more variety on our plates. Originally from the US, this niche trend is now followed by farmers in Austria, Switzerland and Germany, whose products are in demand, mainly in top gastronomy. Even international corporations such as PepsiCo and Nestlé have signalled their intention to use more products from regenerative agriculture in their own supply chains.

Producing hops and malt

BEST PRACTICE: HUMBOLDT REGENERATION BREWERY & FARM

McKinleyville, a place on the north coast of California, is the home to the "Humboldt Regeneration Brewery & Farm". The brewery cultivates its own barley, wheat and hops and uses them to produce regenerative beer. The objective is to raise society's awareness of regenerative cultivation methods with the help of this popular drink. The brewery and farm serve mainly local communities with the CSB Growler Club programme. People interested in this idea are able to obtain membership cards, receive a certain amount of beer per year and support the company at the same time. The owner, Jacob Pressey, made education part of his company's mission: the master brewer runs seasonal tours of the farm to give on-the-spot insights of the importance of regenerative agriculture.

humboldtregeneration.com

Regenerative snacks for a healthy food system

BEST PRACTICE: MOONSHOT

Can snacking make the world a better place? Julia Collins, a young mother from the United States, created Moonshot in answer to this question. This start-up works with farmers practising regenerative agriculture and buys farm products from them at a fair price that reflects their quality. Crackers are the final product which is not only made with regenerative wheat but also packed in recycled paper and dispatched by climate-neutral transport. The company also created the Planet-FWD platform to spread the word about the concept of regenerative agriculture. The platform provides support to other companies that have set the same goal as Moonshot: to create nutrient-rich, healthy soil.

moonshotsnacks.com

Image: Moonshot

Image: Biohof Mühl, Barbara Pacejka Fotografie

Optimised organics

BEST PRACTICE: BIOHOF MÜHL

Rice from Lower Austria? Yes— and it can be found at Johannes Mühl's farm in Marchfeld, east of Vienna. In addition to rice, the farmer cultivates soybeans, carrots, turnips, wheat and hazelnuts, organically and regeneratively on 90 hectares. Mühl supports the "Humus Bewegung" (Humus Movement) in its aim to promote regenerative agriculture. His objective: to make the soil in the granary of Austria more resilient to increasing drought. At the same time, Mühl is reducing his fields' vulnerability to heavy rain, which has caused more frequent harvest losses in traditional agriculture over recent years.

biohofmuehl.at

Vegetables from the company garden

BEST PRACTICE: SOILFUL

Regenerative food for everyone is the vision of the Viennese start-up "Soilful". It gives companies the opportunity to grow vegetables using regenerative methods on the roofs of their offices and factories. The vegetables can be cooked directly in the canteen kitchen. In this way, even non-food companies can contribute to a holistic transformation of the food system. The deal: Soilful sets up the roof surfaces to be used for market gardening and is responsible for running the roof farms. Employees maintain the company's market gardens as a place to relax, become actively involved in the harvesting or cover their own personal needs for fresh vegetables.

soilful.net

The Biggest little Farm

BEST PRACTICE: APRICOT LANE

Apricot Lane Farms, a regenerative farm operating in California since 2011, is the star in the documentary film "The Biggest little Farm", which made it onto the Oscars shortlist in 2020 and won numerous other awards. More than 200 varieties of fruit and vegetables are grown regeneratively at Apricot Lane Farms, a farm founded by Molly, a chef from Santa Monica, and her husband John, who were looking for high-quality ingredients for their kitchen. The dynamic ecosystem also includes sheep, cows, pigs, chickens and ducks.

apricotlanefarms.com

Image: soilify.org

Platforms for pioneers of regenerative agriculture

BEST PRACTICE: SOILIFY & CO.

Scattered throughout Europe various platforms have emerged aiming to support and aide farmers who are interested in regenerative agriculture. One example is given by the platform Soilify which since 2021 is committed to connect farmers following this approach. Thereby promoting genuine methods of regenerative agriculture. "Die Zukunftsbauern" (The Future Farmers) pursue similar goals. The Swiss federal platform "Regenerativ Schweiz" (Regenerative Switzerland) has already connected 17 organisations following the motto "Learn, read and network". In the UK, regenerative agriculture is advocated by "Hollyrose" offering country-wide seminars and consulting services.

soilify.org; hollyrose.eco; regenerativ.ch; diezukunftsbauern.de

Image: GRAND GARTEN

Diversity in market gardening

BEST PRACTICE: GRAND GARTEN

Since summer 2019 fresh local organic vegetables directly from the farm are available at the GRAND GARTEN in Absdorf, Lower Austria. The market garden, managed by organic farmer Alfred Grand, produces over 50 different vegetable crops and more than 150 vegetable types using manual cultivation methods. The principle of a market garden is to create as much productivity as possible on a relatively small area of land while continuously improving the fertility of the soil. Grown on garden-like plots, the crops are produced directly for the local market. In the GRAND GARDEN, the small area of less than one hectare is farmed intensively and efficiently, without the use of pesticides and large tractors. The farm team packs weekly vegetable boxes for customers. The box contains freshly harvested seasonal vegetables and can be picked up from selected collection points or is delivered to the door by cargo bike. This avoids long transport routes and unnecessary packaging waste. The GRAND GARDEN also serves as an open air research laboratory for various national and international research organisations.

grandgarten.at

Trend prediction

Regenerative food will attract the attention of the environmentally conscious foodie scene in the near future and will be a differentiating feature for premium brands and products. In the medium term, regenerative agriculture methods will become a component alongside further important cultivation techniques, such as organic agriculture, permaculture and low-tech methods, which all make a contribution to the bigger, urgently needed transformation of agriculture. The importance of healthy soil and humus has been brought more sharply into focus through popularisation by community supported agriculture, DIY-cultivation and numerous progressive initiatives from environmental activists, which will further promote the concept of regenerative food as a consumer and marketing trend.

THEME FOCUS

Meat

The diverse future of meat consumption

Fusion

The culinary globalisation of our everyday life

THEME FOCUS

Meat

The diverse future of meat consumption

Meat is losing its role as the leading product of our eating culture – certainly in the visions of innovative food technologists, investors and in the vegan discourse on "proper" nutrition. Plant-based food has become one of the key food trends of our time and is no longer of interest only to vegetarians and vegans. In addition to plant-based products, alternatives increasingly similar in taste and texture to meat and fish are emerging. Alt-protein and cell-cultured food are the food industry's new buzzwords. What meat alternatives there are, who the industry's pioneers are, what challenges do we face and what disruptive technology has the potential to upend the entire food system as we know it? There is a heroic narrative underlying all these questions: The battle to save the planet will be won on our plates.

Alt-protein is the new buzzword on the food scene. It refers to food that requires no animal breeding; it also has significant powers to persuade us that the enormous innovation pressure exerted by "alternative proteins" will radically change the meat, dairy and fish industries and, by extension, global agriculture. Additionally, it will make them more sustainable. The question is therefore no longer whether we will still eat meat in the future, but which meat we will eat.

The answers to this question are many and varied. And the race to find the best alternatives to the still predominant industrial produced animal-based foods of today is in full swing: in addition to "meat" from plants, fungi, insects, algae and microbial fermentation, there is cultured meat derived from animal cells as well as meat from non-industrial, organic livestock or pasture-raised animals. This is being marketed so loudly, especially by the new alt-protein food producers, that it is easy to forget that a sufficiently balanced and healthy diet can also consist of dishes purely made from a variety of vegetables, grains and legumes not meant to replace or imitate meat.

Vegetable dishes versus plant-based food

These days, almost all restaurants and work canteens also offer vegetarian menus with a variety of delicious meat-free dishes. And the top dishes of high-end restaurants tend to be distinctive vegetable dishes rather than beef fillet or wild prawns. Thanks to Ottolenghi and others like him, foodies looking to show off their skills prepare vegetarian or vegan dishes good enough to whet the appetite of even staunch carnivores.

Retailers, the start-up scene and the food industry, however, focus less on creative vegetable dishes and more on plant-based meat and dairy substitutes. The market for plant-based foods has grown so rapidly in recent years that it is easy to lose track. Around the world, new products are launched almost daily. And their raw materials have become significantly more diverse. According to the US market research institute Markets and Markets, soya, the most important ingredient for substitute products to date, will lose its leading position for the first time this year (cf. Markets and Markets 2021). In addition to soya, raw materials include peas and other legumes such as chickpeas or lupins, as well as wheat, oats, potatoes, mushrooms, algae and exotic plants such as jackfruit. The plant-based foods now face competition from components derived from precision fermentation.

Vegan goes mainstream

While at the turn of the millennium vegan meat and dairy substitutes were still largely considered exotic, they have now entered the mainstream. The first vegan sausages and cutlets often contained a long list of additives such as stabilisers, thickeners, emulsifiers, gelling agents, bulking agents and so on. Now, thanks to new technologies, vegan burger patties or plant milk and cheese with fewer ingredients can be bought in every supermarket. The Swiss Coop cooperative, for example, currently stocks over 1,300 vegan-labelled products. Big Food corporations, from Unilever to Nestlé, as well as meat companies from Tyson Foods to Tönnies, have also jumped on the bandwagon. And the bandwagon rolls on unabated. The Boston Consulting Group estimates the market potential for meat and fish substitutes in 2035 to be just under USD 300 billion (cf. BCG 2021). In Germany alone, some 26,600 tonnes of meat substitutes were sold in 2019, an increase of more than 100 percent compared to 2012 (cf. AMI 2020). Germany (with just under 19 percent) and Austria (with just under 17 percent) were among the world's most innovative countries in terms of launching new vegan products in 2021, after the UK, Portugal and the Netherlands (cf. Mintel GNPD 2022). Not surprisingly, as meat substitutes are growing rapidly, the market share of organic products is dropping. While in 2012 the majority of products in this category were still produced organically, most substitute products are now produced conventionally.

The narrative of the alt-protein producers: The battle to save the planet will be won on our plates.

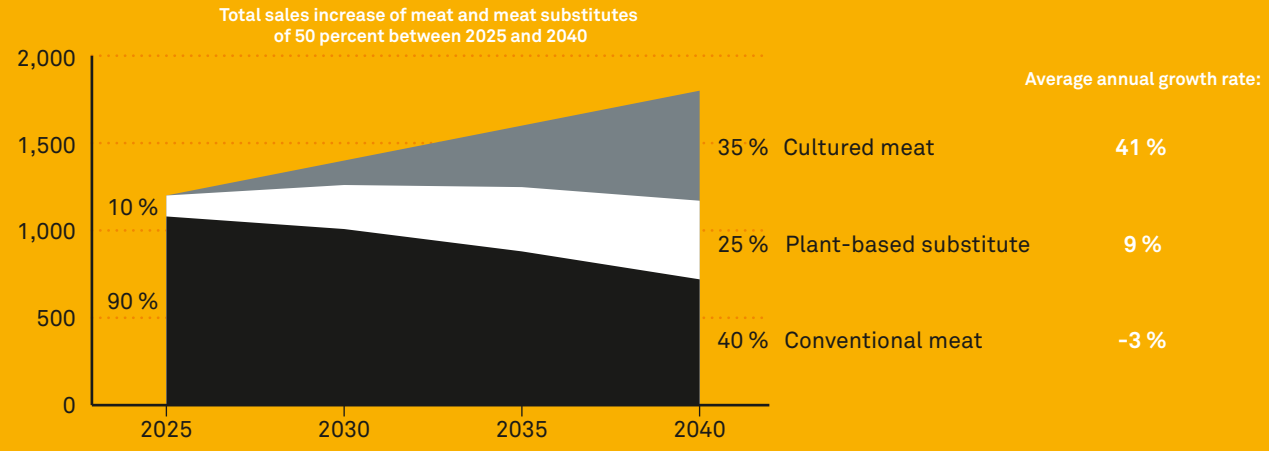
Alternative gold rush mood

Investors are pumping billions into plant-based and cultivated, or cell-based, meat substitutes. The portfolio of Swiss investment company Blue Horizon reads itself like a Who's Who of plant-based and alt-meat pioneers: Impossible Foods, Just, Mosa Meat, planted, among others. Within a few years, the financial market abandoned its initial reticence. Ever since committed entrepreneurs managed to escape from the ideological minefield of veganism and abandon the mantra of doing without, huge sums of money have been flowing into companies that are wooing consumers and investors with a new narrative: saving animals and the planet with profitable, new-generation high-tech foods.

It is not surprising that proteins play a central role in this. Protein is the only macronutrient until now not to be criticised from a nutritional perspective; this is in contrast to fat and carbohydrates, which are repeatedly outed as bad for your health or fattening. The manufacturers of "alternative proteins" support the belief that arose concurrently with industrial meat production in the 19th century and served to justify it, namely that protein (which comes from the Ancient Greek *proteios* meaning "basic" or "primary") is the most important macronutrient. This is indeed a life-critical argument in times of need or when suffering from acute malnutrition; however, if the diet supplies enough calories, there is no need to primarily focus on protein intake.

New meat, alt proteins

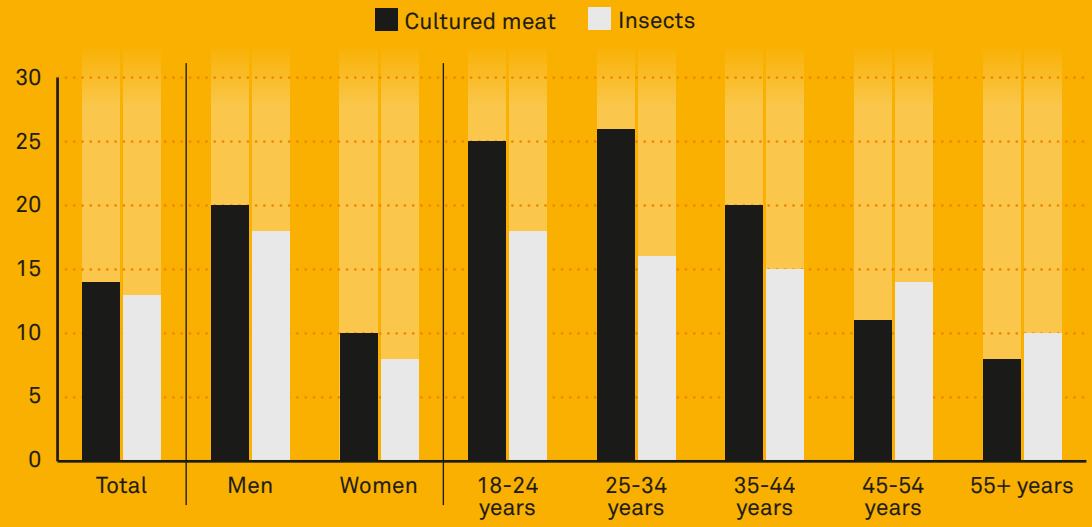
Sales forecasts for meat and meat substitutes and shares of overall sales (2019, in USD billion and percent)



Source: AT Kearney

Younger people are more willing to experiment

Acceptance of cultured meat and edible insects in Germany (2021, in percent)



Source: YouGov 2021

The food industry is following the vegan movement, because it seems that product innovations are only really possible if you want to make substitute products.

From natural to high-tech

The vegan movement, although still followed only by a small percentage of consumers, now dominates the discourse on what constitutes "proper" food, namely food that is future-proof and sustainable. And the food industry willingly follows suit, because it seems that product innovations are now all about substitute products. While top chefs have been tapping into the culinary potential of vegetables, grains, herbs, fruits and spices, vegan food has become the big thing in the food industry. This goes hand in hand with a fundamental change in the perception of food. While the organic movement has been endorsing fresh, unprocessed foods for decades, the veggie movement focuses primarily on "animal-free", paving the way for highly processed, high-tech foods.

This is especially true of the many substitute product innovations designed to imitate the familiar taste and texture of meat, sausages and fish. And thanks to new technologies, this is indeed increasingly successful, even if currently the substitutes more often imitate products, like sausages, that were not very meat-like to begin with. When it comes to sausages, burger patties, fish fingers, ragù alla bolognese, chili con carne etc., it is becoming increasingly difficult to distinguish between meat and meat substitute. The producer Beyond Meat, for example, manages to give its alt-patties the marbled appearance of ground beef by whipping up coconut and cocoa butter into tiny globules of fat. And the Impossible Burger owes its bloody appearance and meat-like taste to what is called a haem, an iron-containing molecule. The molecule is found in animal muscle tissue and, in the form of haemoglobin, in our blood; in smaller amounts it is also found in the soya plant. The food technologists of the alt-patty pioneer introduce the haem gene from the soya plant into yeast cells to produce it cost-effectively using precision fermentation.

Vegan steaks: A challenge not yet mastered

Ambitious manufacturers are still blunting their teeth on trying to simulate whole pieces of meat. Committed companies such as the Israeli start-up Redefine Meat go to great lengths to advertise their plant-based "beef steaks". However, in terms of taste and consistency they do not (yet) come close to the original, as the author and co-author of the Food Report saw for themselves during a tasting in Berlin in November 2021. Better results are being achieved (e.g by the Swiss start-up "planted") with chicken substitutes. Especially chicken breast can be well imitated as it is less complex in its original state than a steak.

The producers of cultured meat face the same problem of recreating the complex structure of muscle meat, even though patties made from cultured meat are barely distinguishable now from conventional mince meat patties. Unlike plant-based meat, which is available everywhere, we will have to wait a few more years before cell-cultured meat is readily available alongside plant-based meat substitutes on supermarket shelves. The corse thereof are not only technical challenges and high manufacturing costs; there are also legal hurdles. For cultured meat companies, this currently translates into a poor market position. However, now that the American start-up Eat Just was able to launch its cell-based chicken in Singapore, other countries will soon be granting approval for cultured meat.

Until recently, the situation was similar for producers of food made from insects, which has only been approved in the EU since 2021. When the first insect burgers landed on supermarket shelves and in fast-food restaurants, veggie burgers were already well established there. However, the thing they all have in common is the now-worn out narrative that "the battle to save the planet will be won on our plates".

Vegetable steak from the 3D printer

BEST PRACTICE: REDEFINE MEAT

Burger patties made from vegetable protein taste almost every bit as good as their meaty counterparts. However, reactions to the replicated fine texture of beef and lamb steaks have so far been muted. The dedicated Israeli start-up Redefine Meat, founded in 2018, is optimistic of solving the challenges of taste and texture to satisfy the palates of foodies. Its CEO and co-founder Eshchar Ben-Shitrit calls last year's developments a milestone. In Israel, the tasty new meat creations are already available in more than 200 restaurants. In the UK, plant-based cuts of meat from the 3D printer are being served in the restaurants of Michelin-starred chef Marco Pierre White, with other restaurants in Germany and the Netherlands to follow shortly.

redefinemeat.com

"Ächt" vegan und regional

BEST PRACTICE: THE GREEN MOUNTAIN

Hilcona Taste Factory, a young company and part of the Hilcona Group, developed the first plant-based steak in Switzerland and launched it under the brand name of The Green Mountain. Whether you like it rare, medium or well done, if you are a gourmet in Switzerland, Austria and Germany and value a meat-free diet you will have benefited from a wider selection of grilled food since 2021. The vegetable protein-based steak is made from regional ingredients and its taste makes it interesting for meat lovers. In addition to steak, other classics such as burger patties, meatloaf, chicken breast and sausages can also be found in the supermarkets, for example at Coop, tegut, Edeka and Spar.

thegreenmountain.ch

Good meat

Less meat, more enjoyment

Image: Herrmannsdorfer Landwerkstätten, Vivi D'Angelo

Even though meat consumption in Europe is declining slowly but surely, Germans still consumed around 55 kilograms of meat per head in 2021 (cf. BMEL 2022). This is too much, not only from a health perspective, but also from an environmental and nutritional point of view. And it is also of course problematic from an animal ethics perspective, because such quantities of low-cost meat can be produced only with industrial mass breeding. To ensure that the earth can continue to feed the world's population in the future, industrialised nations in particular must significantly reduce their meat consumption. This is not just the consensus among environmental and climate researchers, the vast majority of consumers also agree. Although many people find it difficult to transfer this knowledge into everyday practice.

A new meta-study carried out by the University of Bonn analysed the current state of research on various aspects of meat consumption. The researchers recommend that we reduce our meat consumption to ideally 20 kilograms per head per year or less (cf. Parlasca/Qaim 2022). This still seems a long way off. However, the development of alternative proteins from plants, algae, fungi, insects and microorganisms and the production of cultured meat is progressing well enough that a paradigm shift may be on the horizon. The many new options may not just drastically reduce meat consumption, they may also lead to radical changes in animal food production towards extensive, organic livestock farming and wild animals. This would not only benefit the climate and the environment, it would also free up large areas of land globally for the cultivation of plant-based foods that are currently used to produce animal feed. "Good meat" produced in this way is far superior in culinary terms to any industrially produced meat and, along with plant-based "meat" and cultured meat, is also a better alternative to conventional meat from a sustainability point of view.

Good meat comes from wild animals and animals that have eaten mainly grass and not much concentrated feed. It comes from pasture-raised cows, sheep and goats, and from chickens fed mainly on herbs, nuts, fruit and insects. What animals eat and whether they get enough exercise impacts animal health and the taste of meat. The age of the animals and how they are transported and slaughtered also have an influence on meat quality. All these aspects play a minor role in conventional livestock farming, which focuses on efficiency and productivity.

Only the meat of animals that are allowed to reach a certain age has an intense flavour and sufficient marbling. Only stress-free slaughtering ensures that the quality of the meat is not compromised. The "Koch.Campus", for example, an association of top Austrian restaurateurs and producers, which was founded in 2013 and serves as a platform for breeders, is trying to do this in a purposeful and transparent way. They hold regular events where they present their diverse high-quality meat products. This focuses the attention of interested consumers on quality. The association also hosts elaborate blind tastings where the participants find out about the relationship between animal welfare, species-appropriate husbandry, feeding and taste.

And it is indeed not least thanks to high-end gastronomy that non-conventional producers in Austria, Switzerland and Germany are aiming to make animal husbandry more species-appropriate, ecological and ethically justifiable. These producers often far exceed the minimum legal requirements for organic produce, which makes their products significantly tastier.

This also goes hand in hand with a new-found respect for species diversity. Among other things, this prevents the imminent extinction of many regional animal breeds, mainly cattle, pigs and chickens that play no role in conventional animal breeding.

The aim here is not to make society completely vegetarian or vegan, but rather to encourage a new approach to meat as food. There are many benefits to this, and not just culinary ones: species-appropriate, ethically responsible husbandry helps preserve cultural landscapes as well as various livestock breeds that have developed over centuries, especially in the Alps, and it promotes biodiversity on pastures. Livestock farming also plays an important role in regenerative agriculture (see page 33). And finally, there are many regions in the world barely suitable for arable farming and where food could not be produced without animal husbandry.

Image: Rebel Meat

Conscious enjoyment of meat

BEST PRACTICE: REBEL MEAT

The Viennese start-up Rebel Meat offers environmentally conscious flexitarians tasty alternatives that do not require them to quit meat entirely: Rebel Meat aims to gradually reduce meat consumption with its half-meat-half-vegetable grilled sausages in line with the climate-conscious diet proposed by the EAT-Lancet Commission. The ingredients of the burger patties are half Austrian organic beef and half regional organic king trumpet mushrooms and organic millet. The team worked on the mixture for a long time and is planning to gradually increase its vegetable content. True to its maxim “300 grams of meat per week is enough”, the company wants to help people enjoy meat in a more deliberate way. Its focus is on animal welfare and sustainability along with a desire for its hybrid meat products to help raise people’s appreciation for good meat.

rebelmeat.com

Image: Herrmannsdorfer Landwerkstätten, Tobias Köhler

The organic pork pioneer

BEST PRACTICE: HERRMANNSDORFER LANDWERKSTÄTTEN

The farmyard Herrmannsdorf is committed to animal welfare, organic farming and the regional proximity of farmers, processing plants and marketing. Animal breeding, the cultivation of plants and their processing into food are happening in close proximity to each other. The butcher's, bakery, cheese dairy and brewery are all in one place, and they get their supplies from regional farmes themselves. Its founder Karl Ludwig Schweisfurth was advocating better food and the regional connectivity of agriculture as early as in 1986. For example, Herrmannsdorf was one of the first farms in Bavaria to raise organic breeding and fattening pigs. Old livestock breeds such as the Swabian-Hall swine were rediscovered here. This breed produces high-quality meat with special marbling. Some of the fattening pigs, in accordance with the principle of symbiotic farming, live with chickens on pasture during the months before slaughter. Herrmannsdorfer Landwerkstätten includes a network of around 100 organic farmers and manufacturers in the Munich region.

herrmannsdorfer.de

GOOD, NEW, ALT OR NO

A short history of meat alternatives

Plant-based meat substitutes have a long tradition. Seitan, made from wheat protein, and tofu, made from soya, were first eaten regularly in Asia. In addition to economic reasons, religious motives also led to the development of meat substitutes. In Asia, it was primarily Buddhism, and in Christian Europe, fake meat has been commonly eaten during Lent since the Middle Ages. In the New World, it was above all the Seventh-day Adventists who advocated vegetarianism. They successfully introduced the first industrially produced meat substitutes at the beginning of the 20th century. In Europe too, ingredients and recipes for plant-based meat and fish substitutes became popular from the mid-19th century. The reason thereof was the emerging vegetarianism and life reform movements, which came about as a response to ethical concerns and health problems resulting from industrialisation. Since the turn of the 21st century, it has primarily been the vegan movement that emphasised ethical issues surrounding meat consumption. As people become more aware of the major challenges of our time (climate change and global food security), the international food industry is also turning its focus on meat substitutes.

535
The first written mention of **SEITAN** can be found in the Qimin Yaoshu, an agricultural encyclopaedia of great importance for the history of Chinese food and drink culture. Buddhist monks used seitan as a meat substitute, and it was also used to make Chinese noodles.

965
The oldest known written mention of **TOFU** can be found in the anecdotes of the Chinese writer Tao Ku. He praises tofu, the cheap soya-based meat substitute, and refers to it as the “mutton of the vice mayor”.

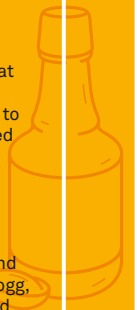
1587
YUBA, soy milk skin leaves, was first mentioned in writing in a diary of tea ceremonies of the Japanese Matsuya family. In Japan, yuba is used as a high-protein meat substitute to this day.

1695
The Chinese novel "Jin Ping Mei" by Xiao-Xiao-Sheng talks about **vegetarian dishes which look like meat dishes.**

1814
TEMPEH is mentioned in writing for the first time on the Indonesian island of Java. The cultivated fermented product was originally made from black soybeans.

1852
Vegetarian sausage is first mentioned outside Asia in the article "An Important Invention" in the American New Hampshire Patriot and State Gazette.

1896
John H. Kellogg develops **NUTTOSE,** a peanut-based meat substitute. It is the first commercially produced alternative to meat which became established on the American market.



1899
PROTOSE, a nut-and-grain blend also developed by John H. Kellogg, is being successfully advertised as "vegetable meat". It is very similar to meat in appearance, taste and smell, and the grain resembles that of preserved meat.

1899
The "Guide to Nut Cookery", a vegetarian cookbook by Almeda Lambert, features numerous recipes for **"meatless meat dishes"**, from nut lobster, mock chicken and vegetable turkey to mock salmon.

1904
GANMODOKI, a deep-fried Japanese patty made with tofu and vegetables, is mentioned in France. Its name refers to it being a meat substitute: translated it means "pseudo-goose".

1911
Li Yuying, a Chinese agricultural economist, successfully applies for a patent in Paris for sausages and meat products made from soya, called **CHARCUTERIE DE SOJA.**

1922
The US company Madison Foods develops **SOY BEAN MEAT,** a soya-based meat substitute. In the US, soya meat substitutes take the place of the previously sold nut-based meat alternatives. The "vegetarian meat market" is successfully served by Madison Foods as well as Kloss Health Food and La Sierra Industries. The owners of these companies are all members of the Seventh-day Adventists.

1937
Madison Foods launches the first vegetarian soya burger in the US. Two years later it is given the name **ZOYBURGER.**

1941
CHOPLETS, a vegetarian substitute for pork chops, is introduced to the US market by the company Special Food. The main ingredients of the vegetarian pork chops are wheat protein, oats and soya grit.

1945
CHOPLET-BURGER is the name of the second meat-free burger in the US. It is also a product of the company Special Foods.

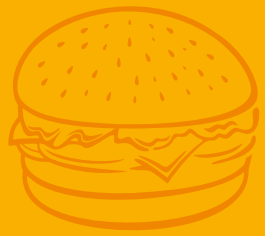
1952
Robert Boyer, an employee of Henry Ford, patents the production of meatless foods from spun vegetable protein. The term **SYNTHETIC MEAT** is used for the first time in the patent application. The soya protein fibres developed by Boyer enable an entirely new kind of meat substitute. Since they are not suitable for processing at high temperatures unlike tinned food, these meat alternatives are frozen.

1962
The first **frozen meat substitutes** based on Boyer's patent hit the US market. Ten years later, they are distributed by various producers in almost all American supermarkets.

1979
SUN BURGER is launched as one of the first plant-based frozen burgers from the Boca Foods Company. Today Kraft Foods makes the burger, which bears only the name of its former manufacturer, **BOCA BURGER.**

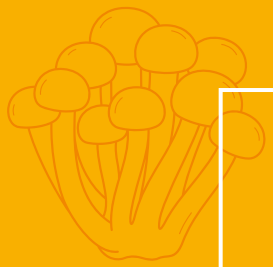
1981
The first commercial veggie burger is rice- and vegetable-based. It was called a **GARDENBURGER** and was developed by Paul Wenner, the owner of a vegetarian restaurant in the US state of Oregon.

1985
The British company Marlow Foods launches the **QUORN** patty, based on the fermented mycelium of the *Fusarium venenatum* sac fungus.



1995
TOFURKY, the plant-based turkey substitute for Thanksgiving and Christmas, conquers the US market and quickly becomes the most recognised "alternative meat" brand. It is produced by Turtle Foods Inc.

1997
Burger King is the first fast-food chain in Germany to offer a veggie burger. A year later, McDonald's follows suit with its **GEMÜSE MÄC,** which was later to be replaced by the **BIG VEGAN TS.**



2013
The California-based company Beyond Meat sells chicken substitutes by the name of **BEYOND CHICKEN** in the organic supermarket chain Whole Foods.

2013
The Austrian meat and sausage producer Neuburger launches its patented organic sausage substitute **HERMANN FLEISCHLOS,** based on king trumpet mushrooms.

2013
The Dutch in vitro meat pioneer Mark Post introduces the first patty **made from cultured bovine stem cells** in London. Hanni Rützler has the opportunity to give it a taste.

2014
In Germany, the company Rügenwalder Mühle, known for its sausage specialities, expands its range to include vegetarian and later also **vegan sausage substitutes.**

2014
Beyond Meat launches its pea protein-based **BEAST BURGER.**

2016
The **IMPOSSIBLE BURGER** from Impossible Foods is the first "bloody" vegan burger on the market.

2016
The American start-up Memphis Meats introduces the public to **meatballs made from bovine stem cells.**

2017
Essento Insect Food produces an **insect burger** and distributes it via the Swiss supermarket chain Coop.

2019
Nestlé brings the **GARDEN GOURMET BURGER** to the retail sector. The structure of the veggie burger is created using soya and wheat protein.

2019
Aldi and Lidl sell their own-brand **vegan burger patties.**

2020
Singapore becomes the first country to approve cultured meat, paving the way for the California-based start-up Eat Just Inc. to sell its **in vitro chicken nuggets.**

2021
The Austrian start-up ZIRP Insects is distributing its **EAT FOR FUTURE** burger patty via the BILLA supermarket chain. Buffalo worms make up almost 40 percent of the patty.

2021
Future Meat, an Israeli start-up, is the first company in the world to announce that it has broken the five-dollar threshold in the production of its **cultured chicken meat.** This means 110 grams of cultured chicken breast can now be produced for 1.70 dollars.

Image: planted

Tasty Swissness

BEST PRACTICE: "PLANTED"

The plant-based products of the Swiss start-up "planted" can be found not only in supermarkets, but also in top restaurants such as "Neue Taverne" in Zurich or Tim Raue's restaurant in Berlin. Gourmets particularly appreciate the chicken substitute made of vegetable protein. Its fibrosity and bite are promising, and it contains no preservatives or additives. The food-tech company has been re-defining meat with a scientific joy for experimenting since 2019. It is well on its way to revolutionising the German speaking regions' traditional meat-based food culture: in Vienna's schnitzel restaurant Figlmüller, which has prided itself on being the "home of the schnitzel since 1905", you can now enjoy the "Figlmüller-style planted.schnitzel". This vegan version of the Viennese classic is now also available to amateur chefs. A wide range of "planted" products, including chicken cutlets, kebabs, pulled pork and schnitzel, is already available in many supermarkets in six European countries. And if you want to know how the products are made, you are welcome to take a look behind the scenes of the glass-walled production facility. Meet Food par excellence.

eatplanted.com

Image: planted, Pascale Weber Photography

Cultured meat & fish

Visions from the laboratory

Cultured meat, or in vitro meat or clean meat, refers to meat produced using cell culture techniques. The technique involves taking cells from living animals by biopsy, mainly from cattle, chickens, pigs, fish and seafood. These cells are then propagated in a growth medium, in bioreactors, outside the animal. This establishes a permanent culture, a cell line. Cell lines can be based either on primary cells – such as muscle or fat cells – or on stem cells. The advantage of stem cells is that they can mature into any cell type using different nutrients or genetic modifications. In addition, stem cell lines have an unlimited lifespan, which means they can be used to manufacture a product forever.

In addition to meat, fish and seafood, this technology can also be used to produce other types of animal products such as leather, milk or chicken-free egg white. Since no animals are killed in this process, cultured meat is also suitable for people who for ethical reasons abstain from eating meat, fish, meat products and dairy products.

So far, it has been possible to grow unstructured meat from the fast-growing meat cells to make meatballs, chicken nuggets, sausages and burger patties in laboratories and in the first pilot plants. Mosa Meat, founded by in vitro food pioneer Mark Post, who presented the first cultured beef patty in London in 2013, was able to produce several kilograms of meat per month by the end of 2021. Making steaks is a lot more difficult, because chunks of meat are much more complex. The spatial structure and marbling that characterise a steak are expected to be replicated in the future using, for example, edible nanofibre scaffolds to which meat cells can attach and grow. The American cell-agri company Matrix Meats specialises in the production of such nanofibre scaffolds. 3D printing is another key technology for the production of structured meat. Some companies, such as the Israeli start-up Aleph Farms, have developed a bioprinting technology that allows them to produce complex cuts such as rib-eye. Other manufacturers, such as BlueNalu, the US pioneer of cell-cultured seafood, use other processing technologies tested in high-volume food production and are good at replicating the consistency of fish.

Cultured meat test kitchen

BEST PRACTICE: "THE CHICKEN" FROM SUPERMEAT

"The Chicken" in Tel Aviv is the first test kitchen in the world to serve a set menu of cultured chicken dishes. Their sustainable, environmentally and animal-friendly cultured chicken fillet is produced by the Israeli food-tech start-up SuperMeat. The tastings in the test kitchen are free of charge – they are asking for honest feedback on the laboratory chicken in lieu of payment. Guests also have the opportunity to watch the chef-cum-engineers prepare the food – Meet Food a little differently. It is very important to the team of developers to be transparent about the creation of their cultured chicken meat – from the chicken cell to the burger patty. Their goal is to generate enthusiasm for cell-cultured meat through open communication and genuine proximity to the production process.

thechicken.kitchen

Rib-eye for the future

BEST PRACTICE: MEATECH 3D

The Israeli start-up MeaTech 3D is sprinting ahead in the cultured meat business with its 3D bioprinting technology and cell culture process. The company is testing the replication of typical highly complex meat textures that come close to those of farm-raised meat. It has already achieved milestones with its marbled rib-eye steak. The steak has streaks of highly complex intramuscular fat running through it that are hard to imitate. Living bovine cells are added to bioinks, then the steak is printed and it matures in an incubator. In this way, stem cells are turned into muscle and fat cells. In Belgium, the subsidiary Peace of Meat is planning to build a pilot plant for the production of cultured chicken fat. The aim is to "accelerate market entry of plant-based meat alternatives and cultured products," says Arik Kaufman, the company's CEO. MeaTech 3D is expanding across Europe as well as in the US; it is currently opening a branch in California.

meatech3d.com

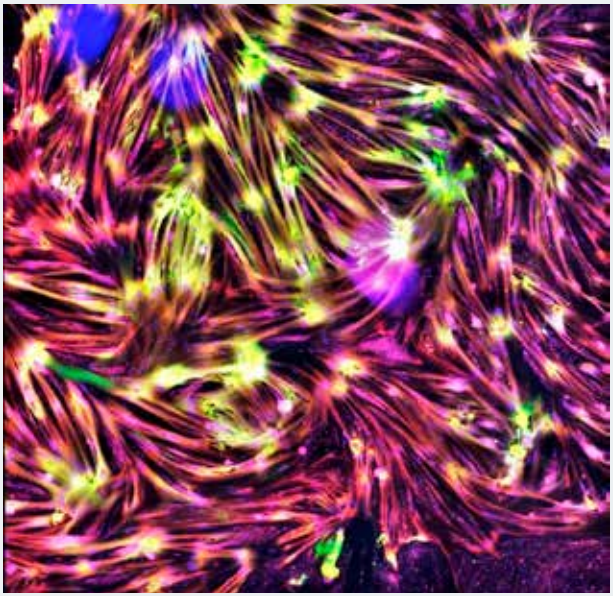


Image: MeaTech 3D

Muscle fibrillation of cultured meat, impressively visualised using fluorescence microscopy.

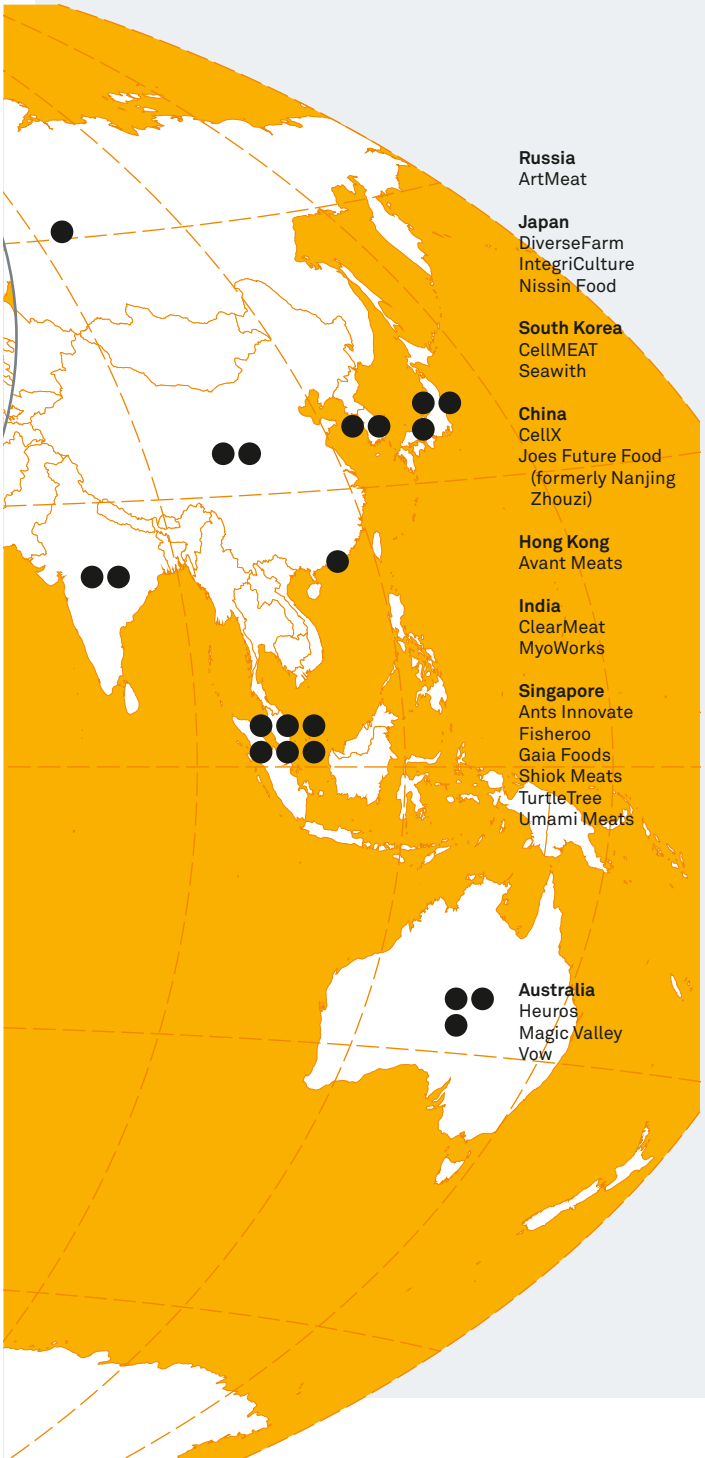
But establishing cell lines under laboratory conditions and in small pilot plants is one thing; it is a much bigger deal to scale this up for the mass production of cultured meat able to be sold at a competitive price. The high costs are still mainly due to the nutrient-saturated animal-free fluids that drive cell growth. They can replace the foetal bovine serum that was used until recently and which violates the basic objectives of cultured meat production. What is more, building the industrial production facilities would involve an enormous investment, which will pay off only once production volumes are high.

Nevertheless, the potential of cultured meat – especially its positive ecological, ethical and climate aspects – continues to fire the imagination of investors, researchers and consumers. Public funding for research and development

Where the future of our food will be made

Companies manufacturing cultured meat, fish and diary (as of: 2022)

Source: Good Food Institute



has now been approved for the first time in the US, the EU and China. Similarly, the number of start-ups involved in the development of cell-cultured meat (and the necessary cell culture media, dietary supplements and methods to produce them) is increasing every year. There are now more than a hundred companies worldwide developing components, services and end products for cultured meat; in 2016 there were just four.

Cultured meat pioneers want to spread optimism to ensure the continued flow of investment. Leading companies are telling us that cultured meat will be able to compete with traditionally produced meat in terms of price by 2030. The companies in this hotly contested cultured food market are dependent on investment to overcome the many hurdles in their way, not least legal ones. However, the first regulatory approval of a cellular nutrition product in Singapore in 2020 (chicken nuggets from the US company Eat Just) raises hopes that more approvals will follow globally in the coming years. The south Tel Aviv-based company Future Meat expects its cultured chicken meat to be approved in Israel as early as next year. 2030 still seems a very ambitious target for launching competitive cultured meat products. Because even if people are generally becoming more willing to eat cultured meat and fish, especially for environmental and ethical reasons, price will continue to play an important role for the majority of consumers.

The young climate-conscious generation is challenging a social consensus, namely that it is okay to kill animals to eat them.

Health, love of animals, climate crisis – the drivers of a meat-free diet

Initially it was primarily health-based arguments pushed by medical professionals, nutritionists and health organisations that were put forward in favour of reducing meat consumption, which has grown substantially since the 1960s. Now, ethical arguments are increasingly being made against the consumption of animal products, especially products from industrial livestock farming. This was in part set off by the bestseller "Eating Animals" by Jonathan Safran Foer (published in Germany in 2010), which popularised the topic far beyond the animal welfare movements. In the years that followed, climate change and the environmental impact of industrial livestock farming gave further momentum to meat avoidance. The facts speak for themselves and can no longer be overlooked even by omnivores. Industrial factory farming and feed production are reaching their limits, both ecologically and ethically.

Policymakers have now also recognised this. The new federal government in Germany has agreed on a binding animal welfare label that covers animal husbandry, transport and slaughter. The production of meat substitutes is also to be promoted and farmers are to be supported as they convert to more species-appropriate animal husbandry.

Which alternatives to traditional meat and dairy products offer the best answer to the dilemma posed by the agro-food systems can of course "only be answered provisionally and inadequately" given the complexity of the interrelationships, says Tilo Hühn, head of the Food Composition and Process Design centre at the Zurich University of Applied Sciences. Not at least, because the provided information in this particular context is "increasingly shaped by the beliefs and goals of representatives belonging to various lobby groups" as well as the influence of ideological and economic agendas is increasing. After all, according to Hühn, the cultivation and production of many raw products, as well as their processing into substitute meat, fish, and dairy products, also requires a lot of energy and resources (cf. Hühn 2021).

Nonetheless, meat-free eating has become an ideal, especially among the younger generation. The Fridays for Future generation has relaunched the animal welfare debate, challenging the social consensus that it is okay to kill animals for food. A recent study by the Georg August University of Göttingen provides representative insights: Almost 40 percent of young adults question their meat consumption. Over 12 percent have stopped eating meat altogether and have become vegan or vegetarian. As many as 17 percent of young women eat a meat-free diet; only 3 percent of them, however, are vegan. Almost one in four young adults describe themselves as flexitarians, thereof

almost one in three is a young woman (cf. Zühlsdorf et al. 2021).

Not just for vegetarians and vegans

The target audience of animal-free food is thus not limited to strict vegans. On the contrary: it mainly addresses flexitarians, substitarians and real omnivores (see the chapter on trends in the Food Report 2022; Zukunftsinstitut 2021, p. 76) – and thus a growing majority looking to reduce their consumption of meat and dairy products. According to "Statista Content Special: Food & Nutrition", more than half of all Germans consumed a plant-based alternative product in the three months prior to the survey. Milk substitutes such as oat or soy milk (25 percent) and non-animal meat and sausage products (24 percent) are particularly popular. Consumers choose soya, coconut or lupin-based yoghurt (20 percent) over dairy almost as often. Germans are a little more restrained when it comes to plant-based alternatives to cheese and butter (16 percent each) and to cream (13 percent). Egg substitutes (9 percent) and plant-based seafood (8 percent) are the least popular (cf. Statista 2021). This is partly due to the comparatively small range of products currently being offered.

The term "substitarians" was coined by the authors of the "Coop Plant-based Food Report". It refers to a target group of people who have been socialised to have a taste for meat and, despite realising that the consumption of animal products should be reduced, find it difficult to change their eating behaviour (cf. Coop 2020). Acquired tastes and a lifelong habit of consuming certain foods are in fact the biggest hurdles when it comes to dietary change. Plant-based substitutes replicating the taste, shape and texture of meat (and able to be used in traditional recipes) are therefore particularly attractive to this target group. Consumers buy vegan sausages because sausages are familiar to them. They eat vegan burgers because burgers have been one of the most popular fast food items for half a century.

The avoidance of meat and the role of eating culture

While acquired taste and a lifelong habit of eating meat are two of the biggest hurdles when it comes to dietary change, it does not explain why consumers in the UK, Germany and the Netherlands, for example, are more inclined to turn to meat substitutes than people in other countries. In France and Italy, for example, people prefer to eat less meat rather than eat meat substitutes (cf. Ott 2017).

To understand this, it helps to look at the different culinary identity narratives: countries with a great traditional food culture as an integral part of their national identity, such

In countries without great national cuisines, substitute products are making their way onto people's plates faster.

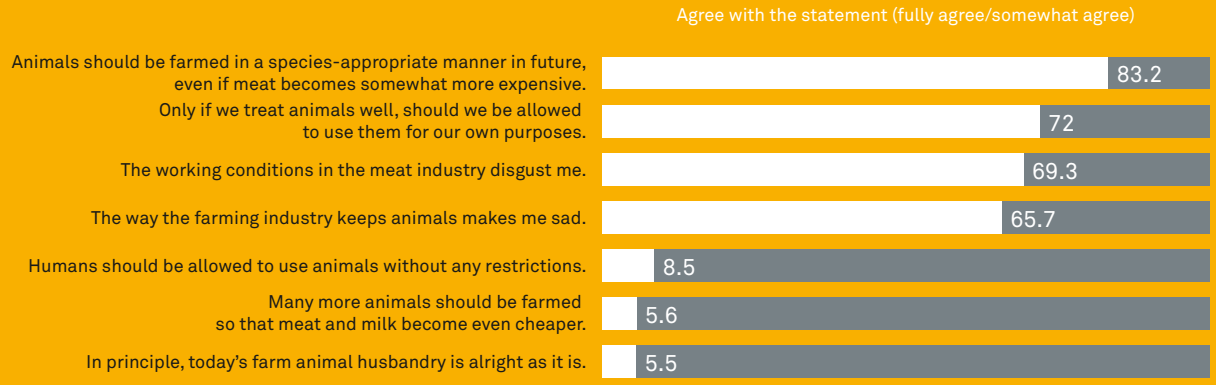
as Italy, France as well as Thailand and Japan, have more serious reservations about new foods and sometimes perceive them as a threat to their identity and food culture. In contrast, other countries (including the Netherlands and Germany as well as the US and the UK) without their own major national cuisines are more open to both culinary globalisation and new foods and dishes. This is especially true for younger consumers.

For the alt-protein companies, this means that they can expect the pace at which meat substitutes become established in different food cultures to differ. Of course, even countries with a great traditional food culture will see their consumption adapt and change. But they may take different approaches and turn to the wide variety of traditional plant-based dishes instead, such as those that exist in Italian cuisine. This is also reflected in the various civil society initiatives ("slow food" in Italy) and government initiatives (mandatory meat labelling in France). To put it simply: it is in the Italians and French interest to primarily preserve their food culture; in Germany, people want to improve eating habits with health, sustainability and animal welfare in mind.

Good meat: animal ethics on the rise

Young adults show diminishing acceptance of today's farm animal husbandry methods (2021, in percent)

Basis: 1,481 respondents between 15 and 29 years old

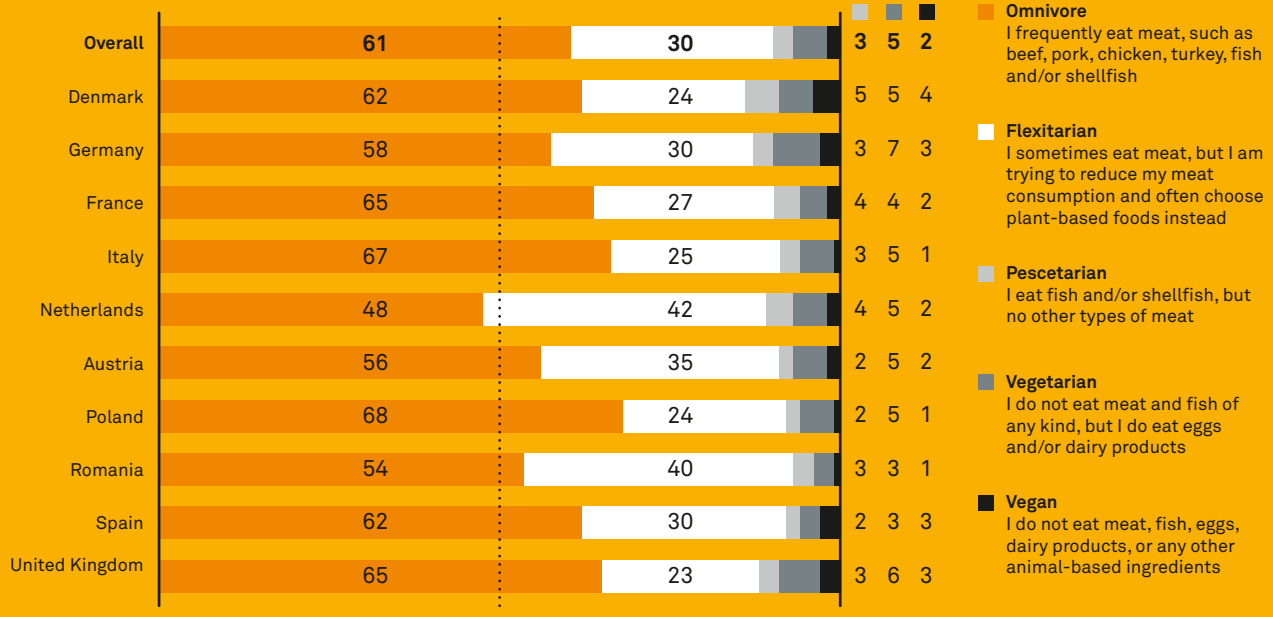


Source: Zühlsdorf et al. 2021

The diversity of diets

Proportion of diet types in selected European countries (2021, in percent, values rounded)

Basis: 7,590 respondents between 18 and 70 years old



Source: Smart Protein Project 2021

Image: Rügenwalder Mühle

Mett sandwiches without regret

BEST PRACTICE: RÜGENWALDER MÜHLE

Openness to changes in eating culture is evident in the rapidly increasing acceptance of classic "meat" dishes without meat. In Germany, the company Rügenwalder Mühle is a pioneer in vegetarian and vegan substitutes for cold cuts, meat spreads and sausages. The food producer has now launched another meat classic in a new guise, the "Vegan Mühlen Mett Sausage". Even though made from peas, it retains the familiar mett sausage taste with a hint of onion. The vegan sausage substitutes are tempting more and more meat eaters. This is reflected in the sales figures: the business segments for traditional sausage products and meat-free alternatives were on the same level, but veggie products are clearly the growth driver.

ruegenwalder.de

The end of food production as we know it?

While in Germany, the Netherlands, the UK and countries with a strong start-up culture such as the US and Israel, plant- and cell-based meat is the talk of the town, precision fermentation is another disruptive technology not yet widely covered in the media: more efficient production of specific animal nutrients using genetically modified microorganisms could fundamentally upend the current agro-industrial food system. Advances in this field will create even better results in terms of taste, with the new products tasting similar to, if not the same as, animal products. In fact, analysts at the US think tank RethinkX believe that these developments will turn food production as we know it on its head. The collapse of the entire dairy and meat industry in the US, RethinkX has predicted by 2030, still seems unlikely (cf. RethinkX 2019). But the potential behind the technology should not be underestimated. Microbes and the nutrients produced from them could become another important pillar in the production of meat-free foods in just a few years – alongside cell-cultured meat and fish and plant-, insect- and algae-based foods (cf. Figueiras 2022).

The production of animal proteins from microbes is very likely to be less energy and resource intensive, while also generating lower CO_2 emissions. What is more, precision fermentation can be done locally and is independent of climatic conditions. It can also jump-start the scalable production of cultured meat, for which it can produce low-cost nutrient media needed for cell growth in cultured meat.

And what happens to the cow, the chicken, the pig and the salmon?

Do we even need or want traditional animal breeding anymore? Even if it is species-appropriate and animal-friendly, if cows and lambs graze on pastures and meadows or pigs and chickens are kept outdoors with adequate space to run around? Will we no longer consume real meat, milk and cheese in the future? Lobbyists like Pat Brown,

The production of animal proteins from microbes could become an important pillar for the production of meat-free food in just a couple of years.

founder and CEO of Impossible Foods, are aiming for just that: "We intend to accomplish this within two decades by creating the world's most delicious, nutritious, affordable and sustainable meat, fish and dairy foods directly from plants" (Brown 2018).

But, to use a suitable German saying: Soup is never eaten as hot as it is cooked. In the best case scenario, the products of Brown and similarly minded entrepreneurs will help to reduce industrial livestock farming and thus, in the long term, increase acceptance of species-appropriate animal husbandry; after all, in many regions of the world where grasslands cannot be used in any other way, livestock farming is a centuries-old cultural asset which quite significantly contributes to the preservation of biodiversity – in the meadows, in the fields and on our plates.

In the future, it will not just be about the lowest CO_2 emissions, the cheapest price or the largest production infrastructure. How well meat and dairy substitutes can establish themselves as part of the eating culture will play a decisive role in its success. What will also play an important role in the future are the ways and means by which the European agro-food system can be made more resilient and more independent of global raw materials. In view of the geopolitical changes triggered by the war in Ukraine, this question has now garnered new urgency. And we should not just rely on high-tech solutions.

Image: OCEANFRUIT

The start-up OCEANFRUIT is working with seaweed farmers who cultivate seaweed on ropes in the fjords of Norway.

Algae

The raw material of the future

Image: OCEANFRUIT

Algae are one the most important oxygen suppliers on the planet. Not just for organisms in the water, but also for humans. One in every two oxygen molecules in the air comes from the photosynthesis of algae (cf. Pejic-Pulkowski n.d.). A distinction is made between microalgae and macroalgae: the former are microscopically small and usually consist of only one cell. The latter are multicellular algae that can grow up to 60 metres in length (cf. Braune 2008, p. 11 ff.).

Macroalgae have been used as food across the world for thousands of years. Algae in the form of seaweed are a classic ingredient in traditional cuisines not just in Asia, but also in Iceland, Wales, Ireland, Scotland, Denmark and Brittany. They can be eaten fresh, dried or pickled such as in seaweed soups or as a seasoning for poultry. The marine delicacies are harvested from wild populations or farmed in aquacultures.

Algae are used in many areas of industry due to their rich chemical composition and the bioactive substances they contain. Their gelling, thickening and stabilising properties have led to the development of such products as agar-agar, alginate and carrageenan, which can be found in many processed foods. Algae are also used in the food industry as a dietary supplement and as a nutrient-rich and healthy additive in functional foods. Algae are playing an increasingly important role in the production of fermented foods. They will also be important in the future for the production of cultured meat and fish products (cf. Herman 2021).

It comes as no surprise then that seaweed aquaculture is one of the fastest growing food sectors in the world. Its production volume is increasing by 8 to 10 percent a year (cf. ibid.). More and more entrepreneurs are beginning to take an interest in this raw material of the future, which is already widely used in Asia. The West has discovered algae for itself. 97 percent of algae is currently still produced in Asia (cf. McKinley Research Group 2021, p. 3). However, both macro- and microalgae are now being cultivated in Europe. Macroalgae are grown in kelp forests close to the seashore. These kelp forests also provide a habitat for a variety of fish and other marine animals. Microalgae on the other hand are cultivated in closed aquacultures away from the open sea (cf. Herman 2021).

Mainly because of their promising potential in the production of meat substitutes and cultured meat, the exact composition of microalgae has attracted a lot of attention. The high protein content of these microscopic algae is one reason why a number of young companies are having research done about the marine plant and its use in the development of plant-based meat products and animal feed. Start-ups researching cell culture media for cultured meat as well as plant-based scaffolds for in vitro steak development are also interested in microalgae. It is already possible to extract proteins from algae in

Image: OCEANFRUIT

Image: BettaF!sh

Image: OCEANFRUIT

Seaweed for sustainable gourmets

BEST PRACTICE: OCEANFRUIT & BETTAF!SH

Seaweed salad as a side dish with jacket potato? With a twist, seaweed also becomes an attractive culinary option for the European palate. OCEANFRUIT, a German start-up, has succeeded in making seaweed suitable for everyday consumption. Their vegan sea salads can be enjoyed on their own as a snack or add the finishing touches to dishes like pizza, pasta or bowls. Since 2021, founders Deniz Ficicioglu and Jacob von Manteuffel have also been producing plant-based tuna from seaweed and broad bean proteins under the name BettaF!sh. The company's TUNAH-Sandwich and TUNAH-Pizza are available at Aldi. The macroalgae for the salads and the "tuna" are grown in the Norwegian fjords. There they provide habitat for many aquatic organisms, while improving marine biodiversity and water quality. On top of that they are also a very healthy food. However, the two founders are not too keen on buzzwords like "superfood". Above all they want their products to taste delicious!

oceanfruit.de, bettafish.co

the laboratory. However, the controlled cultivation of microalgae and the extraction process require expensive high-tech equipment and highly trained staff. Nevertheless, according to the Alaska Seaweed Market Assessment (2021), seaweed protein extracts are expected to be ready for market in 2026. In addition to the high protein content of seaweed, the polyunsaturated fatty acids it contains are also of interest to the food industry. Stakeholders are particularly focused on omega-3 fatty acids, which are difficult to obtain in sufficient quantities from other foods (cf. McKinley Research Group 2021).

While the production of microalgae in closed facilities is still problematic from a sustainability point of view (the bioreactors consume a lot of energy for heating, cooling and ventilation), in the case of macroalgae cultivation the ecological advantages predominate. The key advantage, and the most obvious one, is that the large, long algae grow in the sea and therefore do not put a strain on dwindling resources such as fertile soil and freshwater. Another advantage of seaweed farming is that nutrients are absorbed directly from the water, which means there is no need to add pesticides or fertilisers. There is also the possibility of using macroalgae as part of a polyculture alongside prawns or salmon, for example. In a polyculture, the algae absorb excess nutrients from the animals or help purify agricultural wastewater polluted with excess fertiliser and washed into the sea. This process is known as bioremediation (cf. Herman 2021).

Aquacultures of marine algae have, in theory, the important potential to counteract the greenhouse effect and acidification of the sea, and thus climate change generally. These synergies are based on the biological processes of photosynthesis of algae. They absorb carbon dioxide from air and water and convert it into organic compounds (cf. Pejic-Pulkowski n.d.). However, it will be some time before we know exactly the extent to which seaweed aquaculture can contribute to carbon sequestration. Furthermore, seaweed could significantly contribute to the decarbonisation of existing industries in the future, for example if we replace petroleum-based products with seaweed-based bioplastics.

Algae burger from Amsterdam

BEST PRACTICE: **DUTCH WEED BURGER**

The Dutch Weed Burger combines the advantages of what is called “seagriculture”, the cultivation of seaweed. Seaweed does not need agricultural land or freshwater, and instead grows and thrives with sea water and sun. The sea vegetable is now often called green gold, because it is good for people and good for the planet at the same time. The algae burger can be found on the menu of over 200 restaurants in the Netherlands. The Weed Burger and the Weed Dogg are also available in supermarkets, such as Albert Heijn and Jumbo, as well as in the online supermarket Picnic. It all started in 2012 with a home-made bicycle from which the first algae-based burgers were sold on the streets of Amsterdam. The Weed Burger still attracts attention to this day because people keep asking, and the answer is always no: “Do you use marijuana in your burger?”

dutchweedburger.com

Image: Revo Foods

Regenerative marine gardens of the future

BEST PRACTICE: AKUA

Seaweed from regenerative aquacultures in New England is the main ingredient in the dried meat kelp jerky, kelp burgers and seaweed noodles made by Akua, a New York-based company. Natural ingredients like olive oil, mushrooms, black beans and quinoa give the seaweed burger its finishing touch. It takes about six months from the spore to the harvestable seaweed. It is "sown" in the autumn and harvested between April and June. This cycle alternately complements the agricultural cultivation periods in many places. The marine gardeners also have an eye on the health of the planet, the regeneration times of the water ecosystem and marine organisms. Akua began producing products for the North American market in 2019.

akua.co

Confusingly similar

BEST PRACTICE: REVO FOODS

Even plant-based salmon becomes a delicacy with algae extracts. It is a true alternative to fish, which is endangered as a result of overfishing. In 2020, three students founded Revo Foods, a start-up in Vienna. Their products are now being sold in over 1,400 shops in 14 countries. The plant-based salmon is produced in a 3D printer and is made from a complex blend of pea protein, citrus fibre and oils. Algae extracts give the smoked salmon slices from Revo their salty taste. Consumers are surprised when they taste it; hardly anyone can tell the difference between plant-based and real salmon. And it has another advantage: the vegan version has a much longer shelf life. The company is already working on the creation of salmon fillets, spreads and sushi as well as plant-based tuna products.

revo-foods.com

Insects

The other meat

Insects have traditionally been an important source of protein for more than two billion people in Asia, Africa and South America. However, the booming alt-protein industry in Western industrialised countries is only slowly beginning to exploit the many potentials of insects for food and feed and for achieving a sustainable circular economy. This is mainly due to cultural reasons. Despite compelling nutritional and ecological arguments in favour of eating grasshoppers, caterpillars and larvae, be it whole or processed into a powder, reservations about entomophagy, the consumption of insects, persist. Stubborn food taboos and civilisational disgust thresholds continue to prevail (cf. Rützler/Reiter 2018).

Image: Livin Farms, Paris Tsitsos

However, from a nutritional perspective, a majority of the more than 2,000 edible insects are among the most valuable foods. Their protein content as well as the vitamins and minerals they contain can vary greatly depending on species, feeding and life cycle (egg, larva, pupa etc.). Grasshoppers fed wheat bran, for example, have twice the protein content of their fellow corn-fed grasshoppers. Termites and ants are extremely high in energy (between 100 and 500 calories per 100 grams, depending on the species), while the energy content of mealworms is similar to that of lean beef fillets, and that of grasshoppers is significantly lower (cf. Bandit/Bauer/Unmüßig 2020). As sources of protein, insects are superior to plant-based alternatives such as legumes, grains and pseudocereals, nuts and sprouts, since animal proteins are better at meeting the needs of the human body.

Both from an ecological and an animal welfare perspective there is much to be said for insects as "the other meat". We do not know much about whether and, if so, how pain-sensitive insects are. However, the way they are usually killed, namely by freezing them, comes very close to the natural destiny of cold-blooded animals, which fall into "hibernation" at low temperatures. This means that many insect species can be farmed in large quantities in a more species-appropriate way than pigs, cattle and poultry. Another advantage is the high feed conversion efficiency of insects. They are cold-blooded animals and therefore do not require energy for heat production, which is why they can process nutrients much more efficiently. While pigs and cattle need between five and almost 20 kilograms of feed to make one kilogram of meat, insects need just 2 kilograms on average. Water consumption, which is very high in traditional livestock farming, is low in insect farming (cf. ibid.).

Image: Livin Farms, Aurelian Böhler

A glimpse inside Livin Farms' pilot production plant for insects in Vienna.

For some time now, there have been fewer reservations about the use of insects for feed production than about entomophagy. According to the non-profit organisation International Platform of Insects for Food and Feed, about 90 percent of the three million tonnes of insect protein expected to be produced in Europe by 2030 will be processed for animal feed or pet food (cf. ipiff 2020, Oanh Ha 2021). This not only reduces agricultural land consumption for animal feed production, it also opens up new opportunities for an effective circular economy. Insects can be fed residues and by-products from agricultural production, food waste such as overripe fruits and vegetables, pulp waste from juice production or leftover grain from beer brewing. The Austrian start-up Livin Farm wants to implement this circular economy principle in insect breeding. Their plan is to build insect breeding facilities next to feed production factories in Europe and Asia.

Since processed foods are no longer viewed with as much scepticism by many consumers in the wake of the boom of vegan meat substitutes, the idea of processing insects to make food is also viewed in a completely different light. The Novel Food Regulation, which in 2001 approved two insect species, the mealworm (the larva of the flour beetle) and the European migratory locust (Locusta migratoria), for use as food in the EU, has created the legal basis for this. EU authorities are currently reviewing applications for nearly a dozen further species (cf. Kreutz 2021). This has given the potential market for protein-rich insect-based

Image: ZIRP, Raphael Just

Eating insects for the future

BEST PRACTICE: ZIRP

Christoph Thomann, the founder of ZIRP Insects, has been campaigning for insects to be accepted as part of the diet in Europe's eating cultures for more than ten years. To make this as straightforward as possible, the products developed by ZIRP can be easily integrated into people's everyday eating habits. The insect-based foods such as burger patties, protein bars or ready mixes for soups, risotto or brownies are both tasty and healthy. The insects come from breeding farms in Europe, where they are bred for human consumption under strictly controlled and hygienic conditions. In the summer of 2021, ZIRP opened the pop-up burger bar EAT FOR FUTURE in Vienna with the aim of getting people to overcome their scepticism about insect-based foods. In autumn 2021, the company's burger patties started being sold in the frozen food sections of Austria's BILLA supermarkets.

zirpinsects.com

foods the long hoped-for boost to slowly make up for the initial disadvantage it had compared with plant-based meat substitutes. According to a forecast by the US market research company Meticulous Research, the market for edible insects will be worth USD 9.6 billion by 2030 (cf. Meticulous Research 2022).

Snacks such as protein bars as well as burger patties and pesto show us ways in which insects can be integrated into our eating culture, namely in the form of processed foods that conceal their ingredients (cf. Oanh Ha 2021). Many of the companies specialising in insects as food are small companies with fewer than 20 employees. However, as large companies are also paying more and more attention to the environmental impact of their food production, it is only a matter of time before they also add crickets, beetles, mealworms and fruit fly larvae to the mix of raw materials they use (cf. ibid.). And since for younger consumers in particular sustainability is an important criterion in their choice of food, insects will play an increasingly important role in human nutrition in Europe in the future.

Image: Livin Farms, Paris Tsitsos

Circular insect breeding

BEST PRACTICE: LIVIN FARMS

The story of Livin Farms began when Austrian industrial designer Katharina Unger studied the food system in Hong Kong and, based on her research, developed the first prototypes for raising insects. It started out with small insect breeding boxes for at home and for educational purposes, and is now being continued on a large scale. The Vienna-based start-up Livin Farms launched its Hive PRO technology for industrial insect farming in 2021; it consists of an insect fattening facility and a service model that includes the regular delivery of baby larvae. The automated modular facilities are expected to produce between 500 and 30,000 tonnes of insect protein per year. The model is based on zero waste principles: the insects are fed organic waste (residues and by-products of agriculture) and then processed into feed or food. And the insect excrement can be returned to the cycle as fertiliser for agricultural land.

livinfarms.com

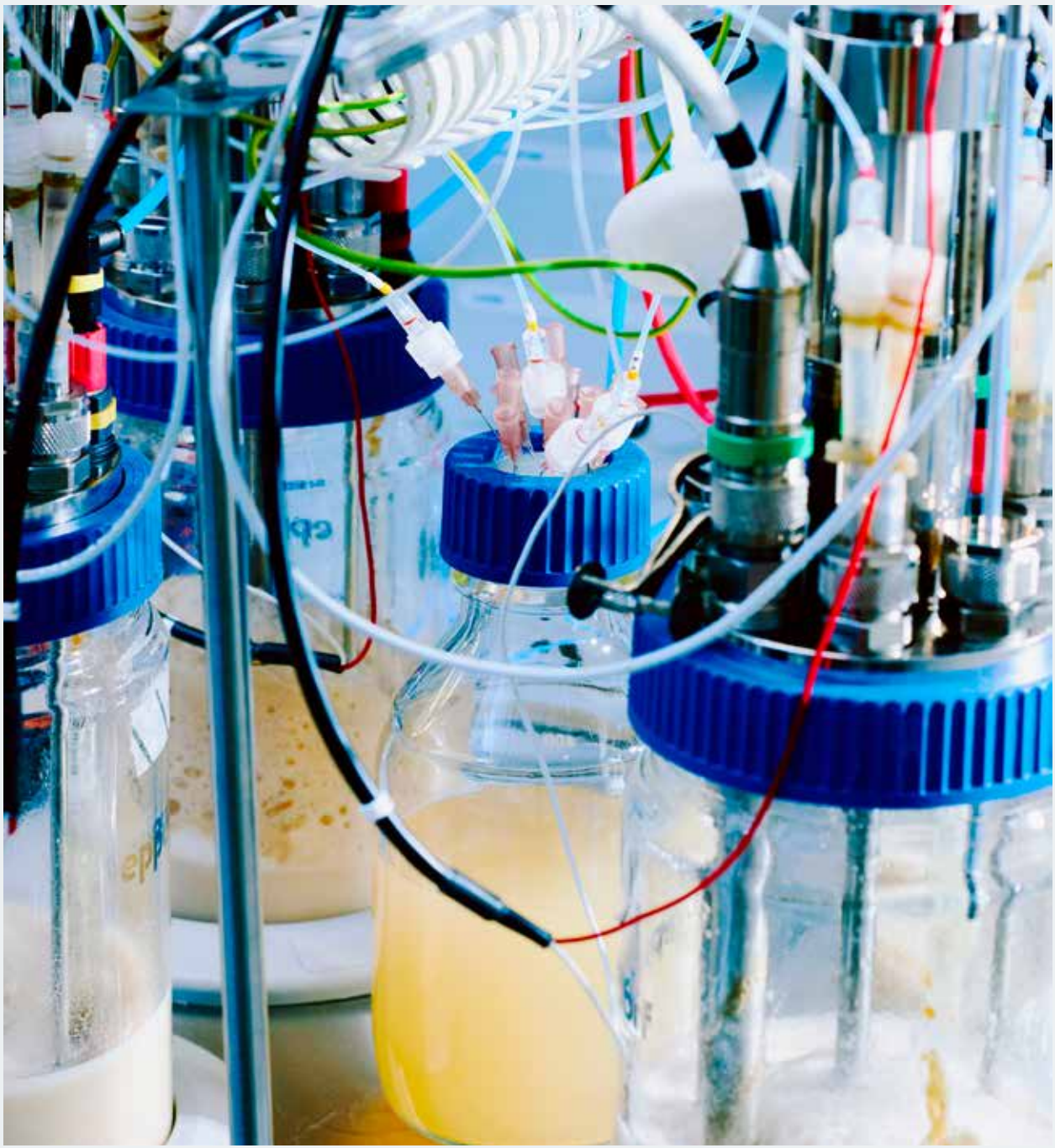


Image: Formo

The Berlin-based company Formo uses high-tech fermentation processes in the manufacturing of dairy products.

Precision fermentation

Fabulous worlds of taste

Fermentation comes from the past and is leading us into the future. This ancient process bridges the gap between tradition and innovative technology, making it an important part of our future dietary worlds.

Fermentation, the use of bacteria, fungi or yeasts to change foods, has been used for thousands of years to make bread, cheese, kimchi, tempeh or beer. Early civilisations used microbial cultures to preserve food, make alcoholic beverages, change the flavour and texture of foods and improve their nutritional value and bioavailability. Over the last century, the role of fermentation expanded far beyond its historical use to include a much broader range of applications. One example is the use of fermented fungal mycelia by the British company Quorn, which launched one of the first meat substitutes in the 1980s. Most vitamins for dietary supplements are also produced by fermentation. Since then, more and more research has been going into the fermentation process and its potential to bring about a more sustainable food system. In the coming years, fermentation will also become a key component in the transition to alternative proteins.

The rapid development of bioinformatics and biotechnological research means that we can now not only select bacteria more precisely, we can also program their function precisely using the Crispr genetic scissors. This is the origin of the term precision fermentation, which includes genetic engineering but also many non-genetic engineering approaches. It is now possible, for example, to use modified bacteria and plant nutrients to grow recombinant proteins that could previously be produced only by animal organisms. The proteins are used in industrial cheese production, for example, where fermentation-produced chymosin is used instead of calf rennet. More and more companies around the world are working on finding the specific animal-based amino acids that are responsible, among other things, for the taste or physical properties of cow's milk. These are then reproduced by programmed bacteria in fermenters, huge tanks that can hold up to 600,000 litres. They are used to produce casein, for example, without cow's milk. This significantly reduces production complexity compared with rearing, feeding and milking in livestock farming. It is also much quicker: in the best case, food ingredients produced in this way can be harvested after only a few hours. This process also means significantly lower methane and CO_2 emissions and energy and water consumption, not to mention animal suffering.

While "wild" fermentation, which has been used in food production for thousands of years, creates complex flavours, with precision fermentation individual flavour components can be isolated and recombined. The same applies to colour and texture. Another advantage not to be underestimated: if the proteins that come out of the fermenter are identical to known (milk) proteins, the food regulatory authorities will approve them more quickly.

According to the US think tank RethinkX, which focuses on identifying groundbreaking innovations, precision fermentation has the greatest potential for producing new foods and alternative proteins. While the think tank's prediction that this technology will halve the number of cattle in the US by 2030 and cause the traditional dairy and meat industries to collapse may be overstated, the shift from macroorganisms to microorganisms is likely to bring about a paradigm shift in global food production in the medium to long term. As the report "Rethinking Food and Agriculture" explains, 10,000 years ago humans succeeded in domesticating macroorganisms such as

Image: Formo

Cheese from the fermenter

BEST PRACTICE: FORMO

The food biotech company Formo, founded in 2019, uses precision fermentation to make more sustainable and healthier dairy products with animal welfare in mind. The Berlin-based company is a pioneer in cellular agriculture. It cultivates real milk proteins from yeasts. Co-founder and molecular biologist Dr Britta Winterberg compares this process to brewing beer. The company adds vegetable fats to the extracted milk proteins to make animal-free cheese substitutes. In addition to soft cheeses, it will also be possible in the future to create aromatic flavours such as those of Emmental, Gruyères and Appenzeller. The tech dairy has ambitious goals: from 2023 on Formo's cheeses will be on the plates of adventurous real-life omnivores. This still requires EU approval as a novel food.

formo.bio

Image: Mushlabs

Mushrooms are the better meat

BEST PRACTICE: MUSHLABS

Field mushrooms, king trumpet mushrooms and the like have more potential than our cookbooks would have us believe. Hamburg-based Mushlabs, founded by microbiologist Dr. Mazen Rizk, uses mycelia, the wafer-thin root structures of fungi to cultivate nutrient-rich meat substitutes in fermenters. The process involves by-products of the agricultural and food industry being metabolised by the mycelia. This natural reuse process allows the mycelia to grow until they can be harvested. The resulting fibre- and protein-rich biomass is the raw material for delicious and nutritious foods rich in umami. Umami is produced mainly by meat, but also by fermented foods such as cheese. This makes mycelia perfect for creating a meat-like flavour without flavour enhancers. Mycelia are also an eco-friendly alternative to soya or peas because their cultivation in a fermenter requires far fewer resources and no agricultural land, and delivery routes are short.

mushlabs.com

animals and plants and utilising them for their own benefit. Now, according to the report, we are on the verge of a second domestication, one that allows us to control and harness microorganisms. This process enables us to produce the proteins that humans need directly, without animal husbandry. The "disruption of the cow", which began when we replaced draft animals with tractors and continued with leather substitutes made from plastic, is now being completed with meat substitutes (cf. RethinkX 2019).

One thing is certain: in addition to the production of cultured meat and plant-based foods, precision fermentation will help significantly to reduce industrial livestock farming in the future, which is an environmental imperative. Moreover, the technology will also boost the other two alternatives because it offers important new tools and source materials. One example is the haem protein derived from precision fermentation, which creates a range of the organoleptic properties of traditional meat burgers; Impossible Foods are using it for their "bloody" burger patty. Another example is obtaining an alternative, non-animal growth medium for growing stem cells for scalable cultured meat production.

Image: Aqua Cultured Foods

Alt-sushi from the lab

BEST PRACTICE: AQUA CULTURED FOODS

Microbial fermentation is also suitable for the scalable production of plant-based seafood substitutes, as demonstrated by the US food start-up Aqua Cultured Foods. The company, which was founded just one year ago, is planning to launch alt-products like Calamari Fries with selected partners in 2022. Aqua Cultured Foods has succeeded in cultivating not only seafood such as prawns, squid or scallops, but also tuna and salmon (Coregonus) based on its own fungal culture and with the help of precision fermentation. What is special about these products is that the muscle fibres of the cut "raw fish" are clearly visible. Anne Palermo and Brittany Chibe, the company's founders, have filed patents for the process, for the fungus strain and its use for the food system. Sushi lovers will soon test the new fish alternatives. The key advantages of alt-sushi: it uses no animal products, is GMO-free and is tolerated by people with seafood allergies.

aquaculturedfoods.com

The power of fungi

BEST PRACTICE: MYCORENA

While Mushlabs won't tell us which fungus type it uses to produce the meat-like biomass, we know that the Swedish company Mycorena uses the filamentous fungus for their vegan protein – and now also for fat. They grow larger mycelial structures from hyphae, branched microscopic filaments, which in turn can be processed into various products. The ICA supermarkets in Sweden are already selling nuggets made from Promyc mycoprotein produced at Mycorena's production facility in Gothenburg.

mycorena.com

Image: Mycorena

Image: Mycorena

MEAT

Conclusion

→ The race for meat substitutes is in full swing: in addition to “meat” from plants, fungi, insects, algae and microbial fermentation, cultured meat derived from animal cells is also gaining ground. Alt-protein food producers in particular are marketing themselves with determination. In the future it will no longer be about whether we eat meat, but which meat we eat.

→ From the health of consumers to the health of the planet, the drivers of meat-free diets are changing as much as their advocates. In addition to the growing awareness of animal ethics, the climate crisis will play a major part in reshuffling the deck. The young climate-conscious generation in particular is challenging a social consensus, namely that it is acceptable to kill animals to eat them.

→ The vegan movement is setting the tone when it comes to sustainable nutrition. It focuses on animal-free foods and therefore puts up with a longer list of additives. How quickly meat substitutes will enter the mainstream depends heavily on the status of the traditional food culture in each country. Mainly because acquired tastes and a lifelong habit of consuming certain foods are the biggest hurdles when it comes to dietary change.

→ Precision fermentation heralds a disruptive technology that could shake up the entire agro-industrial food system. The production of specific animal-based nutrients using genetically modified micro-organisms requires less energy and resources and has the potential to become an important as well as sustainable pillar for the production of meat-free food.

THEME FOCUS

Fusion

The culinary globalisation of our everyday life

Contrary to the trend moving towards the use of more regional and local ingredients, dishes are steadily gaining in internationality. The goal no longer is to experience the most authentic foreign cuisine possible. Neither is integration of foreign dishes such as sushi and samosas into our culinary everyday life or the discovery of new exotic specialities. While experimenting with various ingredients and preparation methods once was only done by the preserve of top chefs, fusing different cooking styles and traditions has become a trend many enjoy and try out themselves. New recipes are constantly emerging on social media. Fusion has become the new normal!

In the 1980s and 1990s, fusion food was primarily a gastronomic trend promoted by top chefs such as Wolfgang Puck in Los Angeles, Jean-Georges Vongerichten in London and New York and Holger Zurbrüggen in Berlin. The approach founded its idea on drawing inspiration from Far Eastern cuisines, especially Japan and Thailand, and developing fusion dishes. Often classic recipes were combined with unusual ingredients from other culinary traditions.

For many people today, fusion – in a much broader sense – is a normal part of their everyday diet: pizza on Monday; sushi on Tuesday; curry on Wednesday; a doner kebab, a poke bowl or falafel as a snack; spaghetti or risotto on Thursday; fish and chips, fritto misto or ceviche on Friday; roast pork, chicken or steak on Saturday and Sunday. Our supermarkets are increasingly offering formerly "exotic" foods – from teriyaki sauce to couscous to curry paste. While these were once exotic specialities, today they are part of the standard range. Specialist online retailers now also enable people outside the major cities to purchase such products. Last but not least, since 2015 immigrants from the Middle East have contributed to the variety of unfamiliar foods, spices and dishes through their own shops and restaurants in many German and Austrian cities.

Pizza, burgers & bowls

Fusion is no longer limited to recipes, the trend has reached further to include menus too. This phenomenon can be observed around the world, and is particularly reflected in food delivery orders. Data collected by Lieferando, Germany's market leader in food delivery, has revealed that the most regularly ordered dishes are in fact not German. The most popular dishes included a variety of American signature dishes, such as burgers and nuggets. In 2021 Italian food, pizza Margherita and pizza Salami were especially high in demand. Further well-liked cuisines were Japanese and Chinese (cf. Lieferando 2021, p. 13). Another occurring trend are so-called bowls. They entail the culinary fusion of Japanese and Californian cuisine as well as the promotion of a traditional Hawaiian dish called "poke" and have managed to establish themselves as a veritable trend in Germany.

While the classic bowl recipe contains raw fish, new variations reflecting the growing vegetarian and vegan movement are emerging and gaining popularity under weighty names like "Buddha Bowl". As not only Lieferando figures indicate, Levantine and North African cuisines are among the rising stars of 2021. Therein the demand for vegan burgers and dishes is steadily increasing. This illustrates how fusion cuisine follows the plant-based food trend. Dishes made from legumes such as hummus or different types of grains with exotic flavours such as couscous make it easier for meat lovers to switch to vegetarian dishes (see also the food trend "Veganising recipes"; p. 27).

Anything goes

The internationalisation of diets is a global phenomenon. An analysis based on Google data carried out by the British company MoneyBeach shows that among the 109 countries analysed only customers in China and Japan prefer their own cuisine for takeaway meals (cf. MoneyBeach 2021).

The fact that Germany of all countries has become the European trailblazer in the globalisation of diets is surprising only at first sight. One of the reasons is probably that Germans were the long-time leaders in worldwide travel. Additionally Germany in comparison to France, Japan or Spain never had a traditional high cuisine, resulting in a less developed "culinary identity". As a result Germans are more open-minded regarding international cuisines and are equally relaxed when it comes to adapting their recipes accordingly. Whether pizza with coriander and artichokes or a bowl with falafel instead of salmon, there are no limits to the variations.

The range of dishes offered by many food delivery services shows: anything goes. The preferred preference of Germans to eat out at an Italian ristorante, a Greek taverna, a Mexican or a Thai restaurant or an Argentine steakhouse

Exotic food worlds under one roof

BEST PRACTICE: PROSI EXOTIC SUPERMARKET

Prosi is neither an Asian nor an African supermarket. Located in the heart of Europe, the grocery shop stocks more than 10,000 Latin American, Asian and African products from more than 150 countries. Instead of having to go from one shop to the next, you can find a huge selection of groceries that you cannot buy at a Spar or BILLA in one place. The Prosi online shop is also available to customers outside of Vienna: offering everything a gourmet's heart could desire. The Prosi Indian restaurant and the beauty parlour with its range of African and Ayurvedic cosmetics and hair products reflect the occuring fusion of many different cultures not just in food, but everyday life.

prosionlineshop.at

The spice revolution

BEST PRACTICE: LYN'S

With these perfect spice blends, you can now make seekh kebabs, tandoori butter chicken or Indo-Thai curries from the coastal region of Goa at home. Aromatic spice blends, such as bhaji masala, a street food spice for vegetables, make experimenting for amatuer cooks who like to cook Indian dishes easier. Making Indian cuisine accessible is not the only objective of the social start-up. The young founders wish to revolutionise the German spice market. The ingredients are organically farmed in India where underprivileged women are given a job opportunity by grinding the spices. Value creation thus is achieved in India, delivering authentic high quality products. This reflects the company's understanding that high quality and social sustainability are dependent. The online shop's blog includes recipes for classic Indian as well as fusion dishes with a new spin, all easy for amateur chefs to cook at home.

lyns.eu

is reflected in the ratio of restaurants and pubs serving German dishes to those serving "foreign cuisines": Only 35.5 percent of all restaurants in Germany serve German food. In a comparison of 17 international countries, this was the lowest percentage. The comparable figure in Italy stands at 77 percent, 73 percent in Turkey and 44.5 percent in France (cf. Waldfogel 2019, p. 29). Even when ordering takeaway the French tend to go for French bistro classics. The most frequently ordered dish via the popular Deliveroo platform in France is "Les Œufs Mayonnaise" (cf. Ledsom 2022).

Pizza, burger, poke to go

The most popular dishes at Lieferando, the market-leading food delivery company in Germany (2021)

1 Italian
1. Pizza Salami
2. Pizza Margherita
3. Pizza Mista

2 American
1. Cheeseburger
2. Beefburger
3. Chicken Nuggets

3 Japanese
1. Poke Bowl
2. Inside Out Roll Sake Avocado
3. Yana Sushi Roll

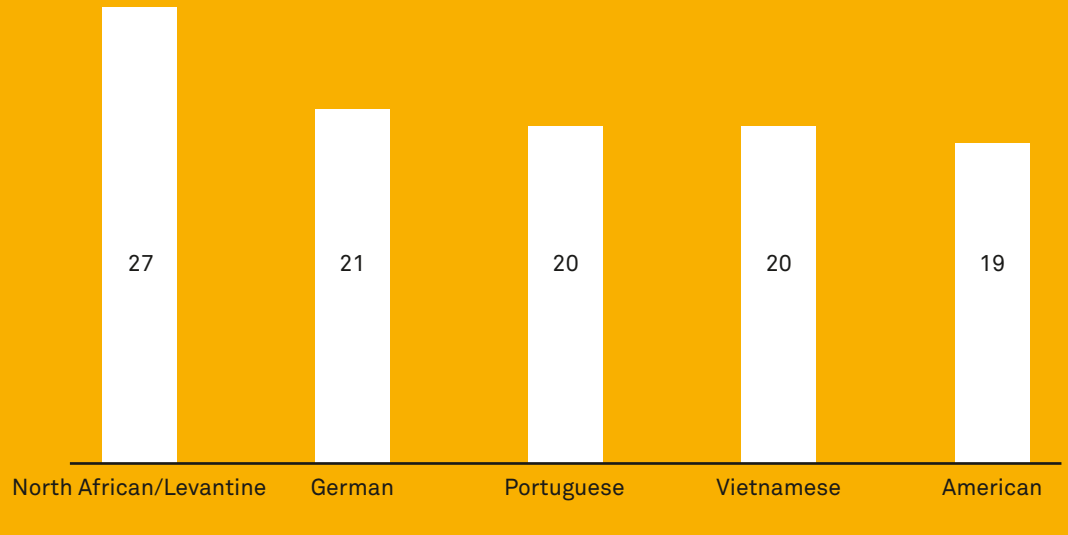
4 Chinese
1. Fried Noodles with Chicken
2. Fried Rice
3. Crispy Duck with Peanut Sauce

5 Turkish
1. Kebab Plate
2. Dürüm Wrap
3. Jumbo Kebab

Source: Lieferando 2021

Levantine – the rising star in delivery food

The fastest growing cuisine in 2021 based on Lieferando orders (2021, in percent)



Source: Lieferando 2021

Clicks on food delivery platforms have a much more direct impact on future catering offerings than the selection of dishes on a restaurant menu.

Delivery food is changing our eating culture – including the recipes we use

Increasingly attractive, user-friendly apps and more efficient driver networks have made delivered ready-to-eat food a major food category, which gained additional momentum during the covid lockdowns. Food delivery remains an integral part of the gastro-landscape even after the pandemic, bringing some fundamental changes with it. One of the changes being that a customer's choice on a food delivery platform has a more direct impact on future catering offerings than the selection of dishes on a menu.

The majority of food delivery customers are younger than the population average: 85 percent are under 56, 39 percent under 35 (cf. Lieferando 2021, p. 32). Since the proportion of vegans, vegetarians and flexitarians is significantly higher in the latter age group, this will particularly impact the range of plant-based dishes in the future. This is also reflected in the current Lieferando order figures: 75 percent more vegetarian and vegan dishes were ordered in 2021 than in the previous year (cf. ibid., p. 7). This dynamic will only accelerate in the coming years, especially given the ever more blatant ethical and ecological problems associated with the meat industry.

Personal fusion

Looking at the most popular dishes of leading food delivery companies such as Lieferando, Just Eat Takeaway, DoorDash or Deliveroo on a global scale, the top sellers are mainly dishes that can quite easily be tailored to individual preferences. Whether it is being able to choose your own toppings or fillings or simply the wide variety of similar dishes from different restaurants and ghost kitchens on delivery platforms. Pizzas, burgers, wraps, bowls, pasta or dumplings can all be turned into a personal fusion dish. Often this means that the dishes have hardly anything to do with what their names suggest. The tacos, for example, the most popular delivery dish at Just Eat in French-speaking Switzerland, are a filled, folded and toasted flatbread: more a mixture of panini, kebab and wrap than an original Mexican taco.

Pasta TikTok style

You can find even wilder fusion creations on the various social media platforms such as Facebook, Instagram and TikTok. In particular, the video platform TikTok, owned by the Chinese company ByteDance and very popular among young people, has become a global platform for sharing recipes. Amateur chefs become kitchen stars after their short recipe videos achieve clicks often in the double-digit million range.

Among TikTok dishes that have gone viral are "Feta Pasta", "Poke Burrito", "Chicken Tikka Tacos" and "Fries with Kimchi". All of those dishes consist of an unusual mix of ingredients, giving them not only a new taste, but transforming them into new independent dishes.

The ease with which one can share and distribute recipe videos on TikTok as well as adjust them to one's own preferences and share the new result, has made an impact on the platform, which was initially best known for its lip sync videos and trendy dance routines. This has a noticeable effect on the retail and fast-food business: the "Baked Feta Pasta" recipe, which has been shared millions of times, caused a worldwide surge in feta cheese sales (cf. Wharton 2021). In the US, the dish is now served in restaurants and cooked in the ghost kitchens of delivery platforms.

Signature dishes on TikTok

Baked Feta Pasta
The umami flavour of the cocktail tomatoes offsets the tanginess of the feta. An unusual touch: the cooked pasta is mixed with a steaming casserole from the oven.

Chicken Tikka Tacos
Chicken tikka on naan with the flavours of a traditional taco.

Poke Burrito
When you combine the culinary tradition of wrapping food with the Asian-inspired ingredients of a poke bowl, you get a Poke Burrito.

Chicken Fajita with Butter Chicken Casserole
This recipe mixes two classics of Mexican and Indian cuisine.

French Fries with Kimchi
Kimchi sauce instead of ketchup: fusion fries.

Pancake Cereal
Small pancakes eaten from a bowl with milk, like a breakfast cereal.

A side effect of enjoying a growing repertoire of dishes from other cuisines is the increasing use of ingredients that were once considered exotic in our everyday native kitchen.

A jump-start for TikTok recipes

BEST PRACTICE: INSTACART & JUMP

The food horizon is widening, including a growing number of signature TikTok dishes. Digital proximity creates an environment that brings different food cultures together. TikTok's Jump feature allows recipes and shopping lists for popular fusion dishes, such as Chicken Tikka Tacos and Poke Burritos, to be linked directly with cooking videos. In spring 2022 the worldwide leading online grocery service Instacart launched a feature called "shoppable recipes". Enabling customers to purchase their grocery shopping recipe-based. All required ingredients – including those not available in local supermarkets – are being delivered in over 5,000 North American cities. Exploration possibilities to discover newish food landscapes become more accessible and fusion dishes are easier to recreate.

instacart.com, tiktok.com

Fusion food delivery

BEST PRACTICE: DELISCHFOOD

At Delischfood, a food delivery start-up from Berlin, the exotic names of the dishes will catch your eye: You can order a Singapore-Spreewald or Bhutan-Brandenburg Bowl, spend "One Night in Bangkok" or pop to "Italy around the Corner". The concept of this delivery service combines the desire for healthy and organic Fast Good – which is likely to be a bit extraordinary as well as a colourful mix of different cuisines. Most ingredients are sourced in Brandenburg. The dishes are cooked in two ghost kitchens in Berlin, where you can also collect them. Alternatively, you can have them delivered to your home – emission-free, of course. The company is planning to expand into other German cities in 2022.

delischfood.com

Fusion for kids

The short cooking videos shared on TikTok and Instagram follow an intuitive approach. Understanding does no longer depend on languages. The influence those videos have on global food cultures is not to be underestimated considering how many young people consume those videos, in addition to those who have never learned to cook at home. The videos visually open up both simple dishes and unusual foods to a worldwide audience. During the lockdowns in particular, food videos became increasingly popular on TikTok, which also has millions of active users in Germany. The users of the app are predominantly children, teenagers and young adults, Generation Z in other words. Almost 70 percent of active users are between 16 and 24. Only 15 percent of users are older than 35 (cf. Firsching 2021).

The brevity of the videos and the casual, relaxed attitude of the amateur chefs are part of the appeal: the recipes are simple and you do not have to sit through a 20-minute video to understand what is special about the presented dishes. Unlike on Instagram, the TikTok cooking videos are much less about the visual appearance of a dish. Viewers want to learn and find inspiration rather than to compete or be patronised.

TikTok's popularity has attracted the interest of some established chefs. For example Gordon Ramsay, who has almost 32 million followers: On TikTok, he rates dishes prepared and uploaded by his fans. The hashtag #ramsayreacts has more than 6 billion views.

Social media shapes our eating culture

Social media has served as a digital cookbook for some time: according to a study commissioned in 2020, an increasing number of people turn to social media rather than using traditional cookbooks in search of cooking inspiration and recipes. In a UK survey, more than 70 percent of respondents have gone digital in their kitchens, with 23 percent getting their cooking ideas from Facebook, 21 percent from Instagram and 24 percent from YouTube. More than one out of ten use TikTok to plan their meals – a figure that is now likely to have increased significantly due to lockdowns (cf. Brimble 2020). Because they are already exposed to international dishes at a young age, whether in restaurants or virtually on various social media channels, the Generation Z is more open to fusion food creations that go beyond traditional food repertoires and will thus shape the food culture of tomorrow.

Middle Eastern meets vegan

BEST PRACTICE: SERAYI DEGERLI

Middle eastern cuisine has more to offer than (vegan) kebab. Cookbook author Serayi Degerli illustrates the diversity of Arabic, Turkish, Persian and Kurdish dishes by a vegan interpretation of classics such as lahmacun, kofta and filled yufka. Her book reflects her passion for Middle Eastern food and animal welfare, her love of nature and the diversity of cultures. Her name Serayi originates from Persian and translates to "the radiance and glow of something precious". In "Orient trifft vegan" (Middle Eastern meets vegan) the creative visionary has compiled a selection of starters, main courses and desserts from her childhood and given them a vegan twist, offering her readers a unique take on fusion food. To make sure that the culinary excursion to the Middle East becomes a resounding success, the passionate chef's online shop sells all the necessary spices as well as high-quality pomegranate syrup, which as the author puts it, is a staple in Middle Eastern cooking.

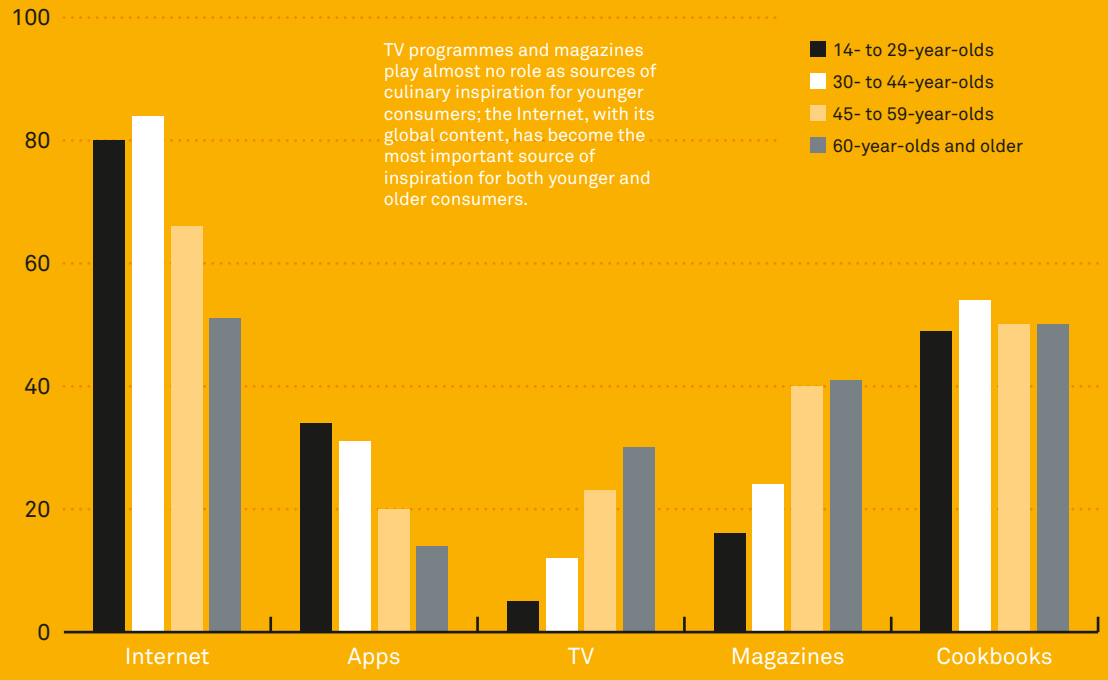
serayi.com

Image: Serayi Degerli, private

The Internet as a recipe book

Where German consumers get their ideas for new dishes and recipes from (2021, in percent)

Basis: Respondents who cook at least now and then, more than one choice allowed

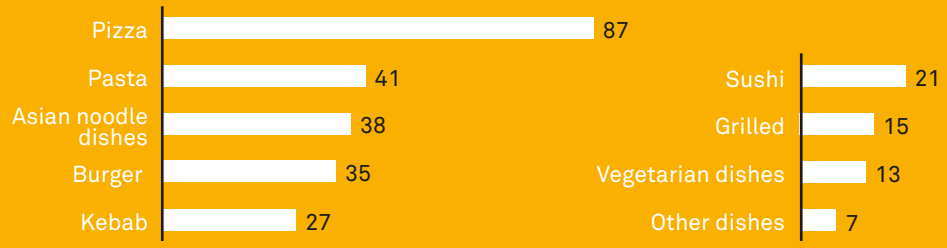


Source: Forsa 2021

It must be quick and customisable

Easily customisable delivery food favourites in Germany (2019, in percent)

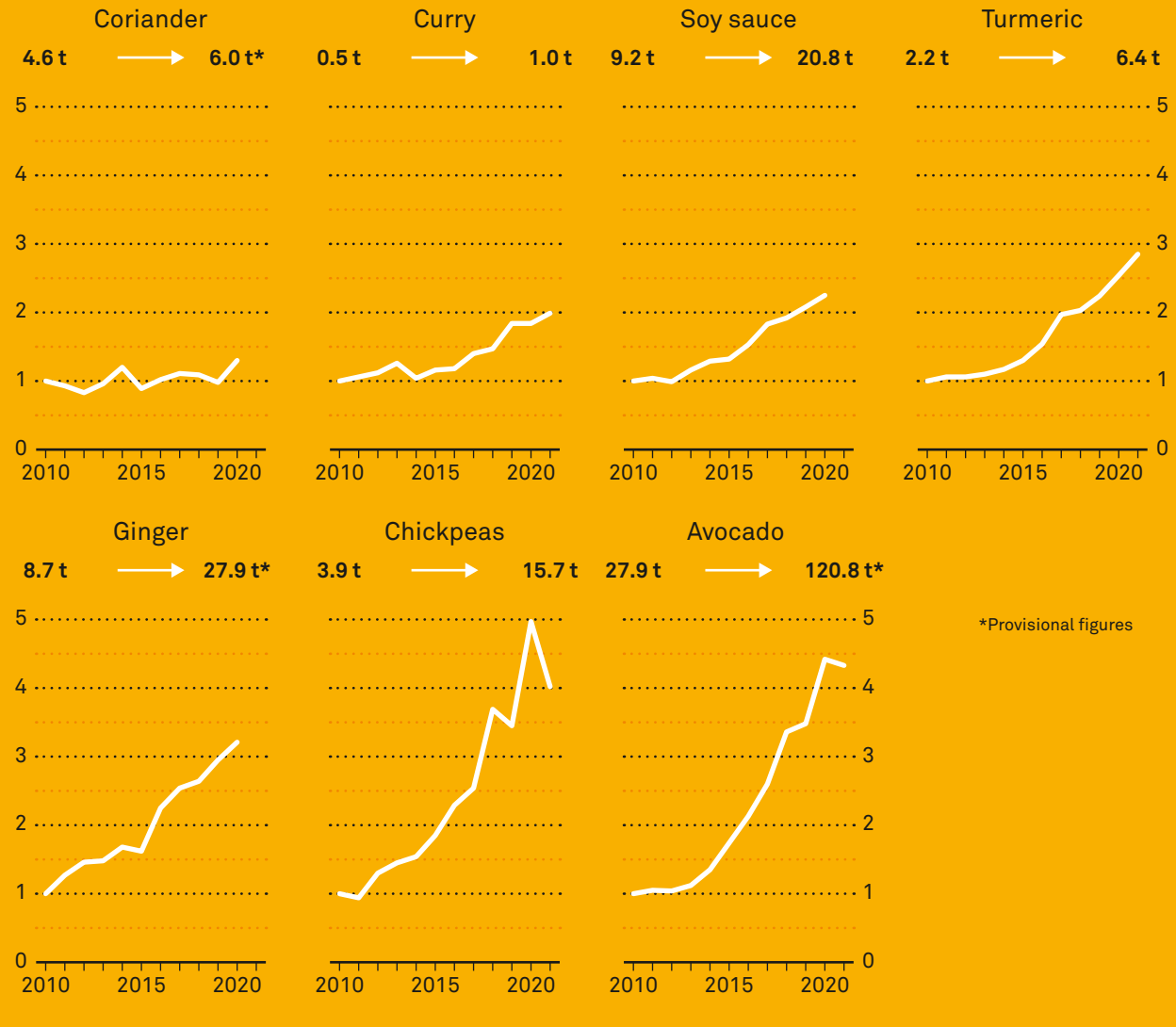
Basis: 1,226 respondents



Source: POSpulse 2019

The world on our plates

Graphs showing imports of selected “exotic” products into Germany (2010 quantity = 1)



*Provisional figures

Source: German Federal Statistical Office 2022

Image: EAT HAPPY GROUP

From the supermarket: sushi and mezze

BEST PRACTICE: EAT HAPPY GROUP

The EAT HAPPY GROUP with its EAT HAPPY brand, combining daily fresh sushi and Asian snacks in a shop-in-shop concept, has been around since 2013. Sushi chefs prepare Japanese rice rolls in front of customers in just a few minutes. Mochi, nori chips and aloe vera drinks are also part of the Asian cuisine EAT HAPPY presents in supermarkets – at over 2,000 locations across Europe. The latest concept is called LOVANTE, fusing the words “love” and “Levante” together. Same principles applied to a different cuisine. The offered to-go dishes consist of a large variety from the cuisine of the Levant: from hummus dip to mezze and laffa rolls to sweet desserts. Just like with sushi, this concept was developed in cooperation with people who grew up with this cuisine. Once again the EAT HAPPY GROUP manages to enhance the supermarket landscape with culinary highlights.

eathappygroup.com, lovante.de, eathappy.de

Image: EAT HAPPY GROUP

FUSION

Conclusion

→ The internationalisation and globalisation of food culture is in full swing. While the trend towards regionalisation regarding raw products continues, the origin of dishes barely matters anymore: the most regularly consumed cuisine has little or nothing to do with nationality and geographic location. In future it will be even harder to distinguish particular dishes from one another as the fusion trend constantly merges cuisines.

→ Once only the preserve of top chefs and high cuisines experimented with fusing ingredients and preparation methods. Nowadays fusion is for everyone and is increasingly becoming a part of everyday life. Delivery food, in particular, allows people to combine ingredients according to their preferences. Resulting in exotic new versions of classic, simple dishes.

→ The influence social media, especially TikTok, has on eating habits, grocery shopping and cooking culture is growing. For now, mainly young people collect their culinary knowledge digitally. However, it can be anticipated that the future food culture will be significantly affected by this development.

→ The easy mixing of ingredients and preparation methods has already created new recipes and trendy dishes. This in turn will not only affect restaurants, but also influence food producers and retailers in the future.

INDUSTRY INSIGHT

Retail

Retail visions

How awareness for sustainability will change the world of food trade

INDUSTRY INSIGHT

Retail visions

How awareness for sustainability will change the world of food trade

"Supermarkets in the future will probably do what supermarkets have done in the past. Change!"

— John L. Stanton, Professor and Chair of Food Marketing at Saint Joseph's University in Philadelphia

—

The contradiction is obvious. Concerning businesses and customers alike. A high percentage of the latter indicate in surveys that they uphold criteria for sustainability and social justice in the choice of their food. Ideally it should be regional, organic, seasonal, fresh, healthy, fair, animal friendly and generate no waste. However, the reality in everyday shopping practices is quite different. Price, convenience and, of course, the available offers in the supermarket dictate our choice of food. The assortment is usually put together according to other criteria. While green advertising promises are given, the wishes and values of a growing number of customers, who would like to shop more consciously, are taken too little into consideration. This must and will not continue.

As analysed in the 2022 Food Report, social and ecological engagement is becoming increasingly more important to consumers. The trend applies particularly in the case of food. Values centred around the topic of sustainability are the decisive key factors. Numerous studies demonstrate this to be true. In 2019, more than 70 percent of Germans stated in a qualitative survey by the Institute of Trade Research (IFH) and the auditors KPMG that they pay attention to sustainability when buying food (cf. IFH Cologne 2020).

The findings were even clearer for young consumers, who placed the focus more strongly on personal empowerment: on awareness of their own responsibilities and wishes to assert more influence on changes in our food system through their own shopping and eating behaviour (cf. Zühlsdorf et al. 2021). The pandemic further raised awareness for sustainability issues, not at least because the strongly growing online food business directed attention to the increasing amount of packaging waste.

Sustainable shopping is not easy

Everyday shopping practice makes it abundantly clear: sustainable shopping is anything but easy. A recent study using in-depth interviews carried out by the Rheingold Institute shows the inner turmoil of young consumers: they are strongly aware of sustainability and climate issues as well as the environment (including animal welfare). Finding a consequent way of coping is hard, especially when trying to live up to one's own convictions while not willing to having to perform an elaborate criteria check every time one reaches for something in the supermarket (cf. planung&analyse 2022). As a result, they often buy what is currently offered in supermarkets and discounters, even though it is against their convictions. In this regard, retailers hardly help to make it easier for their customers to shop in a climate and environmentally conscious way. Their current category management, which encompasses everything from product assortment to in-store signage and shelf management, right up to the distribution of the assortment, is based on completely different criteria.

"Despite all their aspirations," says business psychologist Christine Mack, it is therefore "not easy even for Gen Z to live completely sustainably" (ibid.). In their eyes, reducing meat consumption and avoiding plastic no longer goes far enough. Their personal aspirations and the perceived pressure to live sustainably and consume fairly are often so high that young people feel overwhelmed when buying food. Caught between accepting responsibility and the wish to be free of stress, they seek help above all from companies, producers and retailers. They buy their food mainly from supermarkets, discounters and online retailers, who are all looking for a good margin and change course only cautiously in such a highly competitive sector.

Although advertising campaigns in food retail are increasingly built around green messages, the concept of sustainability often has hardly any effect on the core activities of many companies. In large retail chains, aspects such as purchasing, store operation and decisions about the supply chain are distributed among many different departments and employees. If performance indicators and sustainability targets are not precisely defined, they are scarcely taken into account in day-to-day decision-making. Sustainability usually plays no role in price promotions, which make up a large proportion of sales. According to a 2019 study by international management consultants Oliver Wyman, only 10 percent of 50 world-leading food retail companies measure the financial effects of their sustainability efforts (cf. Siemssen/Lierow 2019). Obviously that complicates setting concrete and realistic goals for the future.

Small steps towards the great transformation

Can this contradiction between ambition and reality be resolved? Can the repeatedly invoked great transformation towards more sustainable, ecological, fair and animal-friendly food consumption succeed in the light of these contradictions?

In reference to the anticipated "digital transformation", Harry Gatterer, CEO of the Zukunftsinstitut, previously

The ecological footprint of the consumer hardly illustrates itself clearer than within the food industry.

warned against concentrating solely on the "big objective", which no one would ever dare to tackle when seemingly so difficult to achieve. Instead of focusing only on the (necessary) great transformation, Gatterer suggests "to build up the transformation process by enabling small transitions that after all mark the beginning of all larger change". These are to be understood as "a field of possible starting points" from where change can be more easily, quickly and consciously mobilised. According to Gatterer, we can view transitions as origins of a possible future. Just as much is suggested by cultural and media analyst Gloria Meynen in her book "Inseln und Meere" (Islands and Oceans). (cf. Gatterer 2021; Meynen 2020).

These transitions "offer practical starting points to get things going: a strategy of many small steps instead of a single transformational leap". Transitions focus more on processes than on changed states. Thus, it is important for now to map all of these possible steps and make them recognisable. "The real future challenge of our time is to use small transitions to realise great transformations" (cf. Gatterer 2021).

Same applies for the unfolding future of our eating culture and food system. We can see it all over the world in successful transitions happening first in fledgling, committed companies seeking to establish themselves in niche markets. The future is also present in pilot projects run by large retail chains, such as the Penny-Markt in Berlin-Spandau (see page 117). Which consists of 20 touch pads presenting the company's essential sustainability topics in a interactive way for customers to experience.

Overstored urban areas

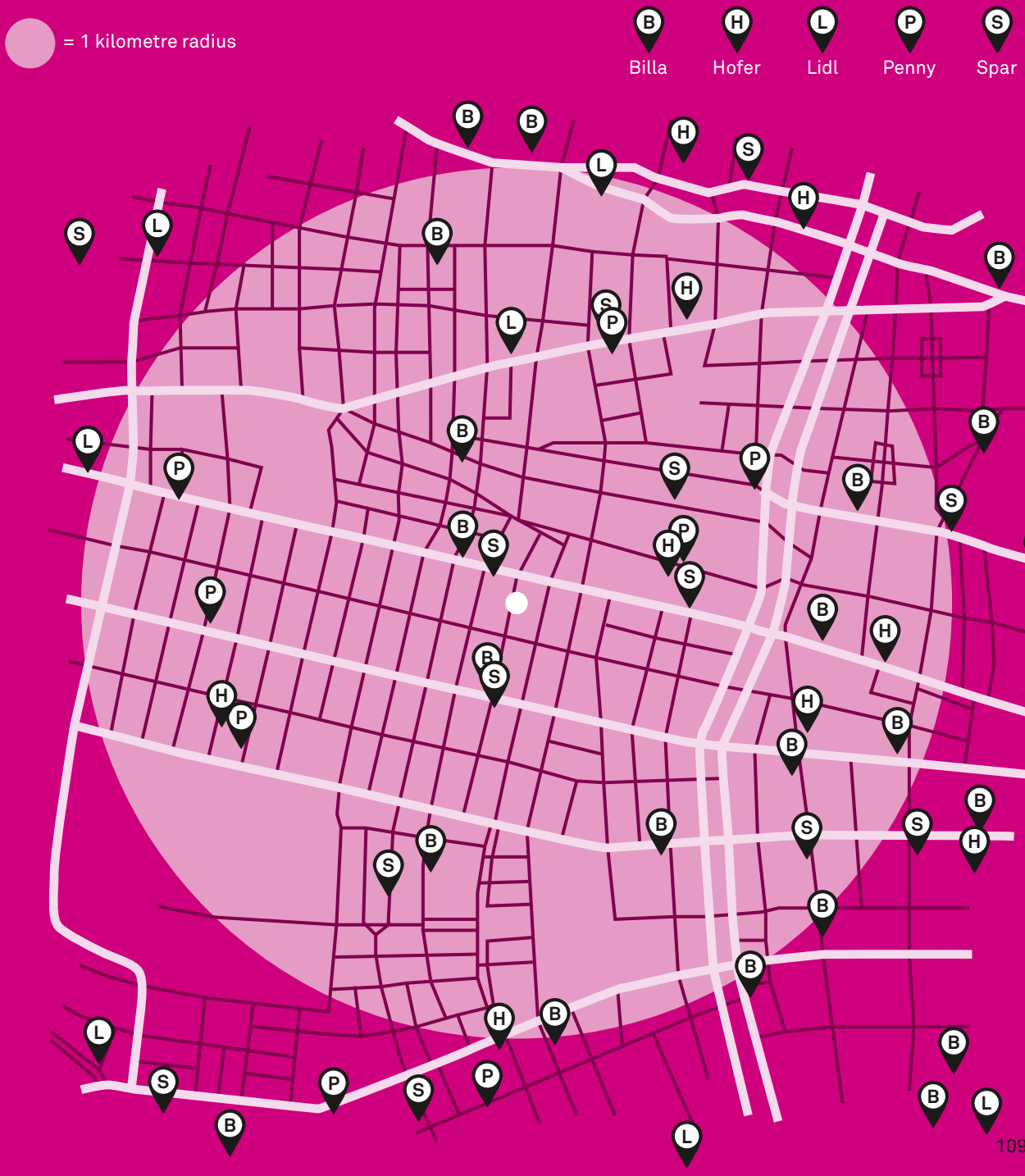
The non-sustainable supermarket landscape and the in-store/online paradox

A long-overlooked aspect of sustainability in German and Austrian food retail is the extreme density of stores, above all in conurbations. No other European country has such a dense network of supermarkets and discounters. Two out of five German consumers (39 percent) live less than five minutes away from a supermarket. Almost half of all Germans (45 percent) can reach a food shop within ten minutes. A high density of supermarkets can also be found in the immediate neighbourhood of the futurefoodstudios, the Food Report author's office in Ottakring, Vienna's 16th District. Spar, BILLA, Lidl, Hofer and Penny all those retailers have supermarkets within walking distance of the office.

In the light of the new possibilities including ultra-fast delivery offered by online retailers, the quality of service offered by full-range retailers with their high floor demand and energy consumption falls short of the current expectation of the customer. In certain parts of large German cities where store density is at its highest, people's preparedness to buy their food online is also at its highest and increasing dynamically. This phenomenon is known as the in-store/online paradox.

One way out of this paradox, which describes the spatial availability of shopping opportunities and the new development of online grocery shopping, is to change the format and size of the current supermarket premises. The new approach could unfold as follows: smaller stores focusing on fresh and convenience products, snacks and on-the-go meals. In these shops, products not stocked in-store can be ordered via touchscreen terminals or by app for prompt delivery. Resizing urban supermarkets will not only increase their sales per square metre of floor area while reducing rental costs, it will also reduce the ecological footprint of these stores. This development will become essential at the latest with the creation of the metaverse. The latter sounds utopian and will take a while to arrive, but the digital parallel world of future retail will make today's conventional supermarkets superfluous. Large sales floors will varnish without reducing our shopping experience.

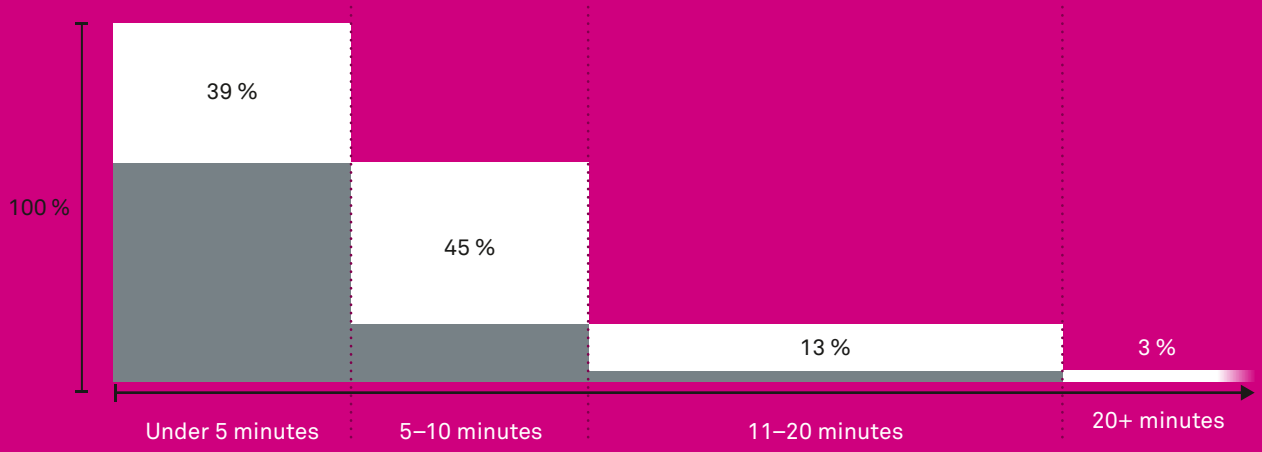
Supermarkets in the area around the futurefoodstudios in the 16th District in Vienna (as of: 2022)



Shopping just around the corner

Walking distance in minutes from home to the nearest supermarket in urban areas in Germany (2022)

Basis: 2,500 respondents between 15 and 65 years old in Germany

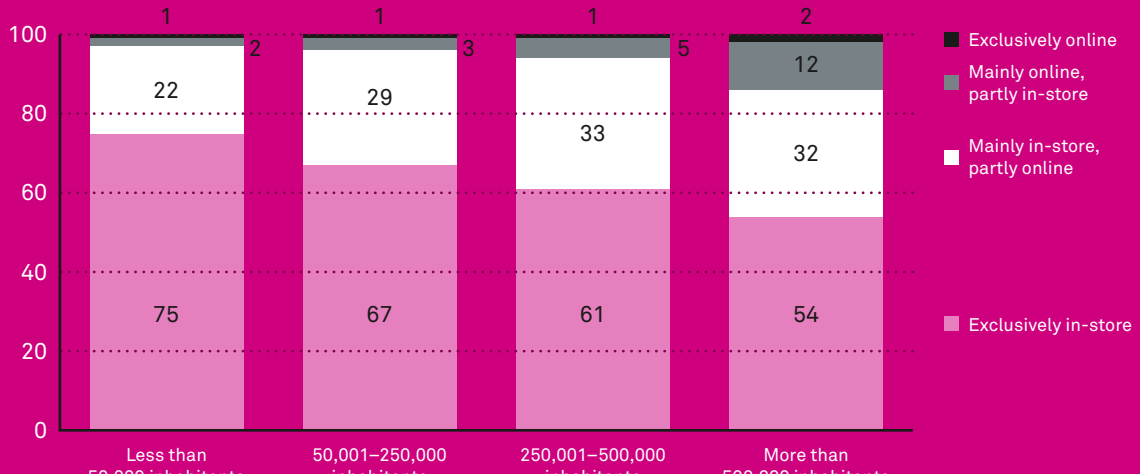


Source: APPINIO GmbH, Spryker Systems GmbH 2022

City dwellers prefer to buy food online

In-store and online shopping behaviour of Germans (in different sized cities) (2022, in percent)

Basis: 2,500 respondents between 15 and 65 years old in Germany



Source: APPINIO GmbH, Spryker Systems GmbH 2022

New ways in the food trade

While traditional category management continues to be the rule in most supermarkets and discounters, primarily with the aim of increasing sales and profits for industry and trade, increasing numbers of engaged producers endeavour to better address the changing sustainability expectations of many customers by offering new formats and services. They are found primarily within the start-up scene, in farming, market gardening cooperatives and among retail entrepreneurs (mainly in the online-only business). They are not only reacting to "outside pressures", stemming from government policies, NGOs and consumer protection organisations, but are motivated by an "inner drive". A look at the websites of these fledgling companies with their consistent vision and mission statements reflects their approach:

They seek to

— gain kudos by plausibly communicating their "inner drive" for more sustainability and discernible measures for mitigating climate change,

— make it easier for consumers to purchase foods in line with what they see as being fair, their values and wishes by offering curated ranges and adapting their category management, and

— increase consumer loyalty by placing particular emphasis on the company's awareness of environmental concerns, animal rights and sustainability issues because their target customers not only consume more ecologically, but also wish to actively take part in the fight against climate change and/or for animal-friendly livestock farming.

A good example for this kind of company is "Too Good To Go", which was formed in Denmark in 2015 and now operates in 15 European countries and the USA. By using and recognising the value of the "Too Good To Go" offer, consumers and companies are playing an active part in the sustainability movement: the successful app connects customers with restaurants and businesses that have unsold leftovers, which they sell at a reduced price to people who are willing to collect them. This cuts down on food waste because restaurants, cafés, supermarkets and hotels no longer have to dispose of food that is still good.

AI counters food waste

BEST PRACTICE: SPRK.GLOBAL

The Berlin-based impact start-up "SPRK.global" is fighting food waste in supply chains and shows that surplus does not mean superfluous. The aim of the start-up, which was founded in 2020, is to reduce worldwide food waste in supply chains and eliminate it in the long term, thereby protecting the climate. Globally, food waste is as high as 2.5 billion tons per year, and the majority of the surplus occurs at the beginning and in the middle of the food supply chain. A corporate AI-driven distribution platform is supposed to calculate an exact "matchmaking" of supply and demand of surplus food in supply chains. The whole idea happens in collaboration with actors of the supply chain who join the platform and benefit from the lower-cost surplus goods. SPRK redistributes these goods with its digital B2B platform or provides a second life to the goods by means of further processing.

sprk.global

Image: Flyby

Fly by for regional produce

BEST PRACTICE: FLYBY

Technology start-up Viabirds combines regionality with a straightforward online platform. Order online and pick up as you fly by: that is the deal at the regional drive-in supermarket chain "Flyby" from Salzburg in Austria. Whether via app or the Flyby online shop, customers can choose from over 600 locally or regionally produced groceries and find more details about the products and producers. The order can usually be picked up on the same day at a Flyby collection point. The collection points are strategically located not far from motorway exits or in car parks. In this way, customers can complete their shopping while going about their daily activities. Although strictly speaking, they drive by rather than fly by. It reduces the logistics effort and emissions on the "last mile" which would be involved in deliveries to the door. Flyby offers local food producers a marketplace for their high-quality products and provides consumers with a quick and transparent means of shopping.

flyby.shop

Retail means renew, change, reorganise and further develop

New concepts in food retail face particular difficulties in the fiercely competitive German and Austrian markets with an extremely high density of retail stores and tremendously price-conscious consumers, aside from specific niches or parts of town with a large proportion of high-earning LOHAS. Many pioneers such as "Emmas Enkel" or "Kochhaus", which we each praised as Best Practice in the first Food Report 2014, have not prevailed against the overwhelming might of REWE, Aldi, Spar, Lidl etc. and had to close or adapt their concept to continue.

Today, however, the big players in retail are under increasing political and moral pressure. The pandemic has given a strong boost to online businesses and opened new opportunities for alternative retail concepts and actions that echo an earlier meaning of to retail i.e. "to reclothe", "renew", "change", "reshape", "develop".

For the future, established companies will find it worthwhile to reflect upon which role in decision making they want to participate in. As well as they would do good to consider how increasingly important sustainable food trends and new value paradigms (see Food Report 2022) will influence and shape the assortment(s) and category management in the future. Because even if environmentally conscious customers try to make more of their purchases at producer markets, in specialist shops, directly from the producers or at new, ecologically focused online retailers (such as gurkerl.at or markta.at), the majority of consumers will continue to buy their food in the supermarket and at the discounter. These organisations are the gatekeepers to our food supply chain. At the same time, they not only have an immense influence on who produces and sells which products, but on our whole eating culture. Inhouse labels continue to grow in stature as does their influence on consumer behaviour and the conditions of our food production.

Image: Marktschwärmer

The best of both worlds

BEST PRACTICE: OMNISTORE

Whether you want to buy fresh and locally sourced food in the shop or order standard products online and pick them up on the way to work: you can do it at the "OmniStore". The concept developed by shop-building company Umdasch and logistics specialists TGW combines the traditional sales floor and a fulfilment centre into one retail business. The result is omnichannelling par excellence. The idea successfully links the strengths of brick-and-mortar retail outlets with up-and-coming e-commerce. The model maximises the efficiency of the warehousing and delivery of the goods during logistics operations, while highly popular fresh food counters and high-class ranges of products encourage shoppers to spend more time in the store.

tgw-group.com, umdasch.com

The digital weekly market

BEST PRACTICE: MARKTSCHWÄRMER

Combining an online shop with a farmers' market, Marktschwärmer brings together consumers and local producers through a new way of direct marketing. Local businesses offer their produce on an online platform while customers order and pay online. Orders can be picked up once a week in person from an agreed venue, e.g. at the producer's farm. This concept places direct contact between producers and consumers, localness and transparency at the heart of food purchasing. This innovative and social buying and selling concept was developed in France in 2010 by the social start-up "La Ruche Qui Dit Oui". Since 2013, the company has held over 1,300 assemblies and formed networks of producers and consumers in seven European countries.

marktschwaermer.de

SUPERPACKED

A design intervention from EOOS NEXT

Art and design play a special role in shaping and changing our food production, consumption habits and eating culture. We discussed this topic in the 2020 Food Report in an article devoted to "Eating Art". For this anniversary edition, Hanni Rützler's tenth Food Report, we were able engage with Vienna's renowned social enterprise design studio EOOS NEXT: the result is the SUPERPACKED design intervention, which takes a critical look at our retail system. The sustainability visions of supermarkets described in the Retail chapter of this Food Report are enriched with photographs that provide the impetus for "disturbing our understanding". This is how Roger Buergel, the artistic director of documenta 12 aptly described the paradoxical interventions of the designers.

For the design intervention, EOOS NEXT speculatively redesigned the presentation of selected supermarket goods and produced an impressive series of photographs working with the photographer Luiza-Lucia Puiu. All the selected products are items of food that, on closer inspection, are problematic in terms of their sustainability, carbon footprint, water footprint, regional origin, nutrient content or contribution to food waste. Conventional product labelling and food labels effectively cover these aspects of sustainability, which is why they can be overlooked or dismissed during the act of buying.

The SUPERPACKED design intervention uses retail marketing strategies, such as exaggeration, enlargement, overpacking, single-use plastic packaging and security-tagged products, and creates design objects that visualise the problematic effects of industrialised food production. In SUPERPACKED, seemingly harmless products "refuse" to be consumed without a second thought: dead-straight cucumbers are presented as luxury products, as are fine cuts of meat. The larger the ecological footprint, the larger the overpacking. A piece of parmesan is immobilised in a "cheese clamp" that must be unlocked at the checkout. The pineapple, having travelled 10,000 kilometres to get to the shop, earns a 10 metre long label, which is printed out at the weighing scales. The loaf of toast floats, nutrient-free, tied to a helium balloon, and the bottle of still water is given a security tag, just like a high-proof alcoholic drink.

The staging of goods by EOOS NEXT exaggerates the usual forms of presentation in a supermarket, so that the act of buying becomes a scene in a play about a dystopian supermarket future. Only by adopting alternative, sustainable consumption habits this kind of dystopian future can be prevented. At the same time, SUPERPACKED makes it impressively clear that supermarkets have a pivotal role to play in the transition from a linear throwaway culture to a climate-neutral circular society. The way goods are presented in supermarkets can make an immense contribution to the transition.

Discounters and supermarkets never leave product placing to chance. With the focus shifting to sustainability, new criteria would have to be considered.

Alternatives to the supermarket of today

Let us explore a thought experiment. Imagine a supermarket in which many current category management practices, from the assortment to in-store signage, shelf management and product placement, would be suspended. A supermarket that would not only comply with the normative values of many consumers, but also raise the customer's awareness for sustainable consumption. This change in retail management would be necessary to ease the transition towards more sustainable and environmentally cautious shopping habits. For the transition to succeed, product assortments have to become more environmentally friendly. Furthermore shelf management and the walking routes of shoppers have to be carefully considered.

What effect in particular the in-store signage and shopping duration have on the purchasing behaviour of store customers was investigated by Ina Hellrung in her 2012 diploma thesis: "In principle a positive correlation between time spent in store and the quantities purchased or amount spent can be assumed. As customers spend more time in the store, they come into contact with more products" (cf. Hellrung 2012).

If a supermarket wishes to be innovative and authentically sustainable, it should not arrange products in a way that encourages customers to buy more of them. This requires a new way of looking at customers: customers are no longer to be "outwitted" while shopping; their wishes for quality, sustainability, fairness and frugality should rather be taken seriously. The Viennese Design office EOOS NEXT managed to visualise this approach through a visionary sketch a few years ago: in this imaginary "supermarket", the shelves are arranged along an organically curved main street where fresh, seasonal and regional goods are displayed. Branching off the main street, side streets offer ranges of less sustainable products: anything from imported tropical fruit and tinned produce to frozen food and convenience products.

Image: REWE | Jürgen Arlt, www.arlt-photodesign.de

A self-sufficient supermarket farm

BEST PRACTICE: REWE GREEN FARMING SUPERMARKET

Growing basil and rearing fish on the roof, resource-conserving construction and operation and a regional weekly market all form part of a sustainable supermarket concept implemented as a pilot project by the REWE Group in Wiesbaden. Timber, a renewable building material, was preferred for the building's load-bearing structure. Daylight enters through a glazed roof and numerous windows to provide natural illumination. The car park makes minimal use of impervious surfaces. An aquaponics system combining fish rearing and plant cultivation in a closed water and nutrient cycle. It goes some of the way towards realising the dream of a self-sufficient supermarket. In addition to highlighting these in-house produced foods, product presentation focuses on the regionally and organically grown products in the assortment. In addition, local farmers are invited to sell their products at a weekly open-air market.

rewe.de

The first sustainability experience market

BEST PRACTICE: PENNY'S "GRÜNER WEG" (GREEN PATH)

The Penny subsidiary "Grüner Weg" in Berlin-Spandau offers its customers a unique purchasing experience: throughout their way within the shop from the entrance all the way to the check-out, customers are informed on touch displays about various aspects of sustainability and encouraged to be more aware of sustainability in their purchasing habits. In the fresh foods department, the aisle starts with wonky vegetables and fruit having minor cosmetic blemishes. Next a shelf displays a simulation of the effects of declining insect populations: Where would the world be without bees? This is followed by a general call in the refrigerated area to "smell, taste and enjoy" before deciding whether to throw away a product because of an expired best before date. On their way around the store, customers repeatedly see products with the vegan inhouse label "Food for future". At the checkout, shoppers are also presented with a calculation of the "true costs" of their purchases. People who wish can round up their bill with a contribution to a good cause. The advantages of this experience store concept: increased awareness of the value of food and food waste is already reduced in the production.

penny-gruener-weg.de

Image: PENNY

Sustainability has clearly become an important differentiating factor in the fiercely competitive food industry.

The routes in the sustainable supermarket are deliberately set out contrary to the purely profit-oriented logic prescribed by today's category management that imprints itself on our "cognitive map". For example, a frequently purchased product such as milk would not be hidden away as it normally is, in the furthest corner of the supermarket. Instead the placement would focus on a spot onto which our gaze naturally falls first, eradicating the need to walk through the whole length of the shop and thereby tempting consumers to pick up a few other unintended items on the way. The same principle would be applied for labelling sustainable, regional or fairly produced products. The fruit and vegetable shelves would be arranged accordingly, so that the average customer, who is unaware of the seasonal calendar, would more easily find seasonal and regionally produced goods.

Sustainable consumption by good design

The EOOS sketch draws an image of how good design and good architecture can help us to behave differently when shopping. Designers taking ideas from traditional street and weekly markets obviously in turn do not mean presenting vegetables in rustic wooden crates and wine departments with mock-up wine cellars. The street market and market hall approach can be convincingly implemented only if the assortment is adapted, the personnel better trained and at last some authentic engagement with the producers is possible.

Consistently thought ahead supermarkets would have to become "super markets" and its butchery and bakery departments reprofessionalised. This refers not only to the quality of the products but also to the quality of the store management's communication with the customer. The supply of fruit, regional and seasonal vegetables in a "super market" would be placed in the hands of the producers. In other words, they would have access to market stalls on which they could "make their pitch" independently of the normal assortment. Finnish retailer Stockmann already does something similar with bakery goods: for one week at a time, local bakers take turns selling their bread and bakery products at a stand of their own in the supermarket.

Moving in a similar direction, the refitted Spar supermarket in the small Cornish village of Carnon Downs has been redesigned. "When we design shops," as Ian Taylor, Retail Director of Spar UK, explained "we match the format to the customer's wishes. We understand that customers of this shop are very interested in local products and sustainability. Therefore we offer them a shop design and a product selection which reflect all these needs" (cf. Harris 2021). At Carnon Downs, this has led to a wide choice of local products (including at the butcher's counter), an in-store bakery and refill stations where customers can bring their own containers and purchase loose products such as nuts, grains, beans, rice and flour without generating packaging waste.

Image: Marks & Spencer plc

Next Generation Store for the local community

BEST PRACTICE: SPAR CARNON DOWNS

The Cornish "Spar Carnon Downs" in the United Kingdom was the first shop designed using Spar UK's new design standard. The supermarket, which has a floor area of over 240 square metres, stocks a broad range of local produce in many categories, with a particular focus on the origin of the food. Among the innovations is a refill station at which customers can fill their own containers with loose products such as nuts, grains, beans, rice and flour. In addition, they can buy baked goods supplied from a local bakery and craft beers. The design of the store meets the requirements of the High in Fat, Salt or Sugar (HFSS) legislation forbidding the advertisement or price promotions of food with a high content of fat, sugar or salt. The new regulations are scheduled to come into force in 2022.

spar.co.uk

Personalised navigation through the supermarket

BEST PRACTICE: LIST & GO

Since the start of 2022, British retailer Marks & Spencer has been testing an app in some of its supermarkets which allows customers to quickly and directly find the products they have previously searched for or placed on their digital shopping list. By means of an augmented-reality display, customers are guided straight to the relevant section of the store. Consumers can not only complete their supermarket trips quicker, but also curate their own shopping lists by indicating the products and brands that best correspond with their wishes and values. They are also better protected against making unplanned spontaneous purchases.

marksandspencer.com

The larger the ecological footprint, the bulkier the packaging.

The parmesan slice has a “cheese claw” and must be unlocked at checkout.

More sustainability with shop-in-shop concepts

IKEA has recently shown that shop-in-shop concepts can also correspond with customer wishes in the non-food sector. The company sells particularly sustainable products and offers ideas, tips and tricks for a sustainable life at home in its "Sustainable Living Shops" inside 36 furniture stores. The aim is to inspire and help customers live their everyday lives in harmony with the environment. This idea could become popular in the food trade and be one of the many small steps that can also be implemented in large supermarkets.

Two things are clear. Firstly that business cases for sustainability are built for the long term and secondly that a sustainable business model for retail will not be achieved overnight. Still it is not impossible as an example from Switzerland shows: the Coop Group has gradually granted sustainability an ever greater role since the 1970s and implemented a completely new, wide-ranging sustainability strategy in 2022. Three years ago, sustainable inhouse and quality labels achieved sales of two billion euro, which account to more than 18 percent of the group's total food sales. The Coop Group's market share in Switzerland in organic products exceeds its overall market share by more than 100 percent. This changes many other aspects of the supply chain, including the vehicle fleet, the consumed energy and handling of packaging and food waste (cf. Coop Cooperative 2022). According to Oliver Wyman consulting, the British department store chain Marks & Spencer achieved net savings from over 168 million US-dollars by cutting down on packaging, reducing the amount of waste going to landfill and by improving the efficiency of its goods transport systems (cf. Siemssen/ Lierow 2019).

Unpackaged goods reduce food waste

Examples like these illustrate ways to make sustainability profitable, even for large food retailers. The key to success and in face of climate change in a landscape that continues to be shaped by fierce competition lies in doing the "right thing". For smaller, independent traders and regional producers as well as cooperative sales and distribution organisations doing the "right thing" often is easier, especially if their business model is based on regional and organic products. Unlike in many supermarkets, customers purchasing from these outlets can buy just the quantity they require and therefore drastically reduce their food waste. A recent British study based on five products (apples, bananas, broccoli, cucumber and potatoes) found that more than 10,300 tonnes of plastic and about 100,000 tonnes of food could be saved (equating to 14 million shopping baskets of food) if they were sold loose and without a best before date. According to the conclusions of the 18-month study, food waste was reduced because customers bought food in the right quantities and decided themselves whether the food was still good to eat (cf. Wrap 2022a/b).

Sustainable values determine our purchases

Importance of the following sustainability-related criteria to the purchase of food and pharmaceutical goods (2020, in percent)

Basis: 500 respondents

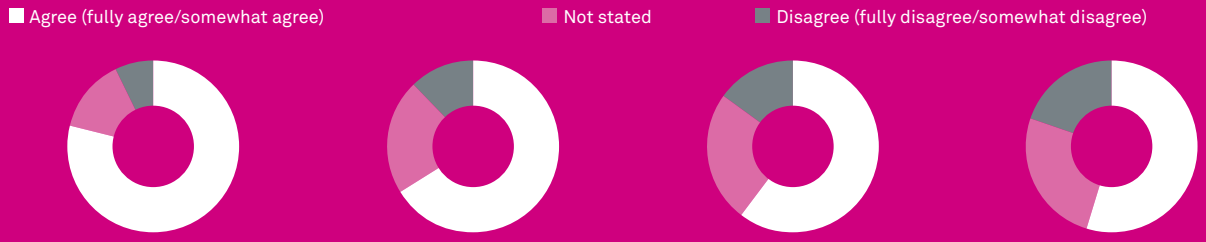
Awareness of sustainability is spreading widely in Germany. The chart shows the importance of various sustainability criteria in the purchasing decisions of German consumers.

Source: IFH Köln/KPMG 2020

Attention: harmful to the climate!

Demands from the younger generation for more transparency about the ecological impact of retail business

Basis: 1,481 respondents between 15 and 29 years old



Source: Zühlsdorf et al. 2021

Image: Gerne Ohne, foto.von.hagen

Image: mymigros.ch

Convenient zero-waste shopping

BEST PRACTICE: GERNE OHNE (GLADLY WITHOUT)

The zero-waste online supermarket “Gerne ohne” has a returnable glass jar system which enables customers to avoid plastic containers when buying food. As well as the reusable jars used for packaging, sustainability at “Gerne Ohne” also extends to focusing on organically grown products. The assortment is made up mainly of dry, highly storable organic products such as flour, sugar, salt, dried fruit, nuts, rice, noodles and various sorts of tea. The ordered food is placed in jars and dispatched. When the jars are empty, customers can send them back to the company – free of charge, where they are washed and reused. Work is ongoing to design a reusable delivery box.

gerneohne.de

The personalised online supermarket

BEST PRACTICE: MYMIGROS

“myMigros” is the first personalised online supermarket in Switzerland. Retailer Migros Aare started the pilot project in 2019 and it now has over 13,000 customers. The company’s goal is to differentiate itself from other online supermarkets. The added value is personalisation based on the knowledge that about 85 percent of the contents of a typical person’s shopping basket do not change from week to week. With this in mind, myMigros shows the customer every product they have bought in the last twelve months. The customer needs fewer clicks to make up the order and shopping becomes quicker and easier. Customers can, of course, also click on another menu to display the full assortment of around 10,000 items, including a higher than usual proportion of local and seasonal products. Delivery takes place in a selectable one-hour delivery window using 100 percent electric vehicles.

mymigros.ch

Image: Gerne Ohne, foto.von.hagen

The pineapple's journey is documented with a 10-meter label.

The toast floats nutrient-free in the air.

The bottle of plain water is provided with a security device, as we know it from high alcoholic beverages.

Image: SuperCoop, Andrea Zoltanetzky

Berlin's democratic supermarket

BEST PRACTICE: SUPERCOOP

The first supermarket organised as a cooperative opened in Berlin in September 2021. "SuperCoop" is a food supermarket run by and for members of the neighbourhood, with participation and conscious food consumption at its heart. Members make decisions on a democratic basis, including agreeing on what products to sell. This participative concept is an answer to the great demand for transparent alternatives in the food trade. Information about pricing, product background and ecological as well as health effects is available to everyone. The range contains mainly fair, organic and local products, with no plastic packaging where this can be avoided. The high-quality products can be sold at a fair price and members of SuperCoop are obliged to help out on an unpaid basis for three hours a month.

supercoop.de

Future scenarios for local food supply in rural areas

BEST PRACTICE: TANTE ENSO

New digital technology for local food supply in the countryside without losing the proven advantages of traditional village shops. This reflects the principle of "Tante Enso", a fusion of the romanticised village shop (known as a "Tante Emma Laden" or Auntie Emma shop in Germany) and a digital 24/7 supermarket. Communities can apply for village shops like these. Determining the shop concept starts as soon as residents have bought 300 shares in a cooperative for the village shop. The range of products offered, the layout of the shop and the staffing arrangements are left to the cooperative members to decide. Outside the traditional opening hours, customers can enter the shop using their Tante Enso card, make purchases as usual and pay at the self-service check-out. In addition to the locally sourced foods in the shop, customers can order products from the myEnso online shop and have them delivered. The hybrid approach of the Tante Enso supermarket offers a solution for the current problem of a shortfall of local grocery shops in rural areas.

myenso.de

Image: Tierwohl.tv

Live-streaming hens

BEST PRACTICE: TIERWOHL.TV

"Tierwohl.tv" supports retailers and farmers to credibly and convincingly communicate their commitment to better animal well-being to their customers. The aim of the platform is to allow customers shopping at food retailers to see an unembellished view on live TV of the husbandry and living conditions of the animals whose meat they wish to buy or eggs they wish to eat. Looking into the barn or across the meadow, the customer can clearly see why it is worthwhile spending more money on food produced by a farmer using species-appropriate husbandry than for meat or other animal products from an anonymous factory farm. Five Edeka Cramer outlets already show Tierwohl.tv at the meat counter and at the egg shelves. The large screens display live images of the organic laying hens at the Cassenshof poultry farm in Lower Saxony. The owner of the local Edeka stores, Sebastien Cramer, wants to leave no doubt about the credibility of his commitment by allowing the customers "an honest and authentic look behind the scenes".

cramer-edeka.de, tierwohl.tv, cassenshof.de

Curated food purchasing by app

BEST PRACTICE: METRO CANADA

The Canadian retail company Metro offers its customers a curated, app-based purchasing experience. The My Health My Choices service is primarily geared towards fulfilling people's individual dietary wishes following the motto "Adapt your grocery shopping to your dietary needs!" Shoppers can choose their food purchases by searching through categories such as gluten-free, vegan, high protein content, keto, paleo etc. In the future, app-based assortments could also be oriented towards fulfilling the wishes of consumers who want to shop according to sustainable, local or organic production criteria. Since 2021, the company has also adopted recyclable containers, so that customers no longer have to purchase meat and sausage products in disposable plastic bags.

corpo.metro.ca, metro.ca/en/my-health-my-choices

Healthy lifestyle from the supermarket shelf

BEST PRACTICE: EREWHON

The Californian health lifestyle supermarket "Erewhon" has a mission: to bring about conscious consumption choices and create healthy communities through wholesome, natural and nutritious food. The focus lies on a range of locally produced organic niche foods and products for alternative diets. Shoppers will search in vain for refined sugar, artificial colourings or flavourings and other undesirable ingredients because of the company's strict criteria for inclusion in its assortment. Erewhon offers direct-to-consumer start-ups an online launch platform for beauty, health and food products that they wish to be included in the carefully curated assortment. Erewhon is a discovery hub for healthy food and has built up a large social media following with many young consumers and wellness influencers.

erewhonmarket.com

Image: myProduct

Digital local

BEST PRACTICE: MYPRODUCT

"High-quality, local and personal! Products – with personality!" is the motto of the Austrian e-commerce platform "myProduct". Since it was formed in 2009, myProduct has offered a sales platform to small Austrian producers who do not have their own web shop because of the burden of the logistics involved. The company manages the selling on the platform, and the storage, dispatch and advertising of the products. The fee charged depends on the type of products and the required storage capacity. In addition, myProduct operates other regional online platforms and cooperates with different digital marketplaces and sales partners. Small producers are able to benefit from this wider network and take their local products directly to the customer.

myproduct.at

RETAIL VISI

Conclusion

→ Sustainability is a core value and is gaining in importance particularly among the younger generation. However, the discrepancy between their actual and personally desired consumption behaviour is very large. Their aspiration to purchase sustainably is made much more difficult to fulfil due to a half-hearted or lack of provision by the largest food retailers.

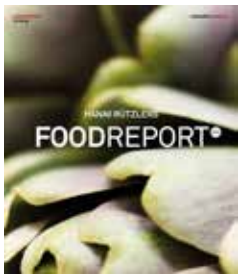
→ Impetus comes mainly from committed producers and retail entrepreneurs who demonstrate with concepts and solutions how food retailing can be made sustainable. Above all, the boom in buying food online has raised the visibility and acceptance of alternatives to the supermarket.

ONS

→ However, visiting traditional food retailers for groceries is still the rule: retail companies and producers who seriously respect their customers' wishes venture into the transformation to more sustainability, seasonality, animal-friendliness and fairness by taking small, implementable steps. Important levers here are not only adapting the assortment but also rethinking category management. From the assortment to in-store signage and shelf management to product placement, supermarkets can support environmentally conscious consumption, instead of making sustainable consumption more difficult.

→ Transforming from a supermarket into a "super market", requires a holistic approach: from shop-in-shop concepts and particularly well-trained personnel to changed product labelling, incorporation of regional products and providing opportunities to engage with producers. The spectrum of options to make supermarkets more sustainable and designed to be more attractive to the coming generations is large.

An overview of all the topics and trend



Food Report 2014

What does food today mean? What do consumers want to eat, buy, believe? The first Food Report gave a comprehensive overview of current consumer trends and developments within the industry.

Food trends

- Curated food
- Flexitarians
- Chefs
- Sensual food
- New gardening
- Reuse food

Industry insights

Gastro
- How food trends are changing gastronomy

Retail
- The 24/7 consumer and new shopping landscapes

Theme focuses

Health
- The new role that enjoyment plays in our health

Food Report 2015

After Hanni Rützler had the honour of tasting the first in-vitro burger in summer 2013, she takes a look at the future of meat alternatives in Food Report 2015.

Food trends

- Hybrid food
- Soft health
- DIY food
- Food pairing

Industry insights

Gastro
- Gastroveggies
- Cocina Novoandina
- The new Alpine cuisine

Theme focuses

Consumers
- The new consumer power
- Food information design

Meat
- Scenarios for the future

Food Report 2016

Eating is the new pop! More and more people use food as a lifestyle-defining element and define themselves through their diet. It is hardly surprising that the kitchen has become the new stage.

Food trends

- Infinite food
- Spiritual food
- Fast good

Industry insights

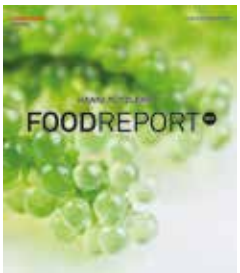
Gastro
- The new classic
- Even more special

Retail
- How the renaissance of the markets is revolutionising the food trade

Theme focuses

Kitchens
- The kitchen as a multifunctional, networked food station

ds in the Food Reports to date



Food Report 2017

What would happen if... ? Hanni Rützler casts light on the big and small visions of the food industry, including the steep career of algae, which are becoming increasingly popular as a nutrient-rich food.

Food trends

- New flavouring
- Convenience 3.0
- Brutal local
- Beyond food

Industry insights

Gastro
- Californication
- Ess-thetics

Theme focuses

Food visions
- From science fiction to science faction

Sea and more
- The future of our food lies in the water

Food Report 2018

The new star of Food Report 2018 is the vegetable! One of the reasons for this is the growing popularity of Levantine cuisine, in which vegetables have always played a leading role.

Food trends

- Meet food
- Female connoisseurs
- The new breakfast

Industry insights

Gastro
- Shalom Europe, salam Germany – The new Levantine cuisine

Theme focuses

De-processing
- The new spin in the food industry

Vegetables
- The end of the side dish – The new role for plants

Food Report 2019

Food Report 2019 celebrates the renaissance of French cuisine! Plus – canteens transition from eating stations to temples of pleasure.

Food trends

- Plant-based food
- Transparency
- Healthy hedonism

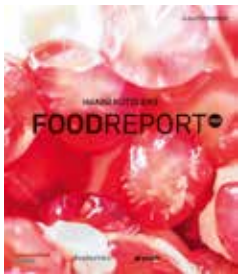
Industry insights

Gastro
- The new French – The renaissance of French cuisine

Retail
- Retailution – From shopping disorder to optimum eating solution

Theme focuses

Canteens
- Nouvelle canteen – The future of the staff restaurant



Food Report 2020

Mealtimes, as we know them, are facing an end. Hanni Rützler opens up a view of the changes in our food culture for Food Report 2020.

Food trends

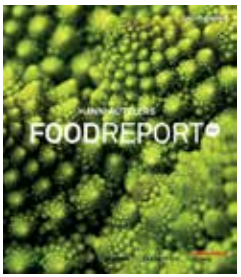
— Food trends in transition

Industry insights

Gastro
— Snackification – The end of mealtimes (as we know them)

Theme focuses

Eating art
— How art and design are changing the way we look at our food
Urban food
— The future of our food supply lies in the city
Beyond plastic
— The future of food packaging



Food Report 2021

In Food Report 2021, Hanni Rützler shows which food trends are crisis-resilient. Ghost kitchens change everyday gastronomy, while growing health consciousness expands our drinking culture.

Food trends

— Food trends – What remains the same and what will change

Industry insights

Gastro
— Ghost kitchen – The disruption of the fast-casual market

Theme focuses

Diversity
— Biodiversity – The future of food lies in diversity
Drinks
— Liquid evolution – Drink better, drink nicer, drink healthier

Food Report 2022

Upheaval and break-up in the food sectors: the pandemic experience will change our long-term consumption and eating behaviour. Increasing connectivity drives structural change forward in the food system.

Food trends

— Zero waste
— Local exotics
— Real omnivore

Industry insights

Gastro
— Vegourmets – Post-corona gastronomy will be richer in vegetables

Theme focuses

The new normal
— Forced change, desired results: How corona will change our long-term consumption and eating behaviours
— Good food, good mood: Our new understanding of healthy eating
E-food
— Connectivity drives forward structural change in the food system

Food Report 2023

The tenth Food Report focuses on sustainability. Hanni Rützler points out the educational role food retailing can play in this context and takes a look at the future of meat consumption.

Food trends

— New glocal
— Veganising recipes
— Regenerative food

Industry insights

Retail
— Retailvisions – How awareness for sustainability will change the world of food trade

Theme focuses

Meat
— The diverse future of meat consumption
Fusion
— The culinary globalisation of our everyday life

Food Trend Glossary

The Food Trend Glossary complements the series of the Food Reports and offers an overview of the food trends, their changes and their significance for the future. It is published to accompany the anniversary edition of the tenth Food Report and is based on the conclusions of the Food Reports along with the research and expertise of food trend researcher Hanni Rützler.

Further information
zukunftsinstitut.de/foodreport

Bibliography

AMI – Agrarmarkt Informationsgesellschaft mbH (2020): Fleischersatzprodukte im Aufwind. AMI 2020/OL-370. In: oekolandbau.de

Bandit, Olaf; Bauer, Barbara; Unmüßig, Barbara (2020): Insektenatlas. Daten und Fakten über Nütz- und Schädlinge in der Landwirtschaft. Berlin

Barclays (2019): Barclays Research Highlights: Sustainable & Thematic Investing. Food Revolution. In: cib.barclays, 14.11.2019

BCG (2021): Food for Thought: The Protein Transformation. In: bcg.com, 24.03.2021

BMEL – Bundesministerium für Ernährung und Landwirtschaft (2022): Versorgung mit Fleisch. Fleischbilanz 2021 vorläufig. In: bmel-statistik.de

Braune, Wolfram (2008): Meeresalgen. Ein Farbbildführer zu den verbreiteten benthischen Grün-, Braun- und Rotalgen der Weltmeere. Königstein, S. 11–13

Brimble, Lucy (2020): More than 70% of adults use social media for recipes instead of cookbooks, survey finds: Research also shows growing numbers of people use smartphones to grow produce at home. In: independent.co.uk, 28.10.2020

Brown, Pat (2018): The Mission that Motivates Us. Impossible Foods. In: medium.com, 23.01.2018

Coop (2020): Plant-based Food Report 2021. Studie zum pflanzenbasierten Genuss in der Schweiz. In: coop.ch, 12/2020

Coop Cooperative (2022): Towards a sustainable future: Our sustainability strategy for people, animals and nature. In: coop.ch, 2/2022

Donnon, Dave; Gerhardt, Carsten; Kühnle, Hans-Jochen; Suhlmann, Gerrit; Warschun, Mirko; Ziemßen, Fabio (2019): How will cultured meat and meat alternatives disrupt the agricultural and food industry? AT Kearney

Fensl, Margit (2015): Immer schon vegan: Autorin Katharina Seiser im Interview. In: janatuerlich.at, 30.07.2015

Figueiras, Sonalie (2022): 12 Alt Protein Trends To Watch: Green Queen's 2022 Industry Predictions. In: greenqueen.com, 20.01.2022

Firsching, Jan (2021): TikTok Statistiken 2021: 100 Mio. Nutzer in Europa & 1 Mrd. weltweit. In: futurebiz.de, 15.11.2021

Forsa – Politik- und Sozialforschung GmbH (2021): Ernährungsreport 2021. Ergebnisse einer repräsentativen Bevölkerungsbefragung, Berlin

Gatterer, Harry (2021): In Transition: Ein neues Verständnis von Übergängen. In: Horx, Matthias (Hg.): Zukunftsreport 2022: Das Jahrbuch für gesellschaftliche Trends und Business-Innovationen, Frankfurt am Main

Hachibiti, Mainga; Thedens, Tim (2022): German Online Grocery Report 2022. Ultimate Overview of Online Food Retailing in Germany in 2022 and Beyond. A study on customer buying behavior, brand perception, and the role of technology, APPINIO GmbH, Spryker Systems GmbH, Berlin, Hamburg

Halloran, Afton; Mertens, Esther; Muir, Giulia et al. (2013): Edible insects. Future prospects for food and feed security. In: FAO Forestry Paper, 171

Harris, Tom (2021): SPAR shop in Cornwall reopens in Carnon Downs, Truro. In: falmouthpacket.co.uk, 26.06.2021

Hellrung, Ina (2012): Das Kaufverhalten im Lebensmitteleinzelhandel: Auswirkungen von Einkaufswegen und Aufenthaltsdauer, Diplomica Verlag

Herman, Steven (2021): Seaweed Aquaculture's Untapped Potential, In: proteinreport.org, 12.10.2021

Hühn, Tilo (2021): Narrative der Nahrung und wie sie uns beeinflussen. In: impact.zhaw.ch, 30.11.2021

IFH Köln/KPMG AG (2020): Consumer Barometer. Fokusthema: Nachhaltigkeit 01/2020

IFH Köln/KPMG (2020): Pressemitteilung: Nachhaltigkeit ist mehr als nur ein kurzzeitiger Trend. In: ifhkoeln.de, 03.03.2020

ipiff – International Platform of Insects for Food and Feed: (2020): Factsheet: The nutritional benefits of insects in animal feed. In: ipiff.org, 2/2020

Kreutz, Heike (2021): Wanderheuschrecke als Lebensmittelzutat: Zweites Insekt in der EU zugelassen. In: bzfe.de, 24.11.2021

Ledsom, Alex (2022): Favorite Deliveroo Take Out During Pandemic 2021 Is Not What You Might Expect. In: forbes.com, 4.1.2022

Lee, Mike (2022): Sustainable global consumer trends and what it means for farmers. In: evokeag.com, 08.03.2022

Lieferando (2021): Lieferando Report 2021: Neuigkeiten, Fakten und Trends über die Essgewohnheiten, das Bestellverhalten und die neuesten Food-Trends in Deutschland. In: lieferando.de, 02.12.2021

Markets and Markets (2021): Meat Substitutes Market by Source (Soy Protein, Wheat Protein, Pea Protein, and Other Sources), Product (Tofu, Tempeh, Seitan, Quorn, and Other Products), Type (Textured, Concentrates, and Isolates), Form, Category, and Region – Global Forecast to 2027. In: marketsandmarkets.com, 9/2021

McKinley Research Group (2021): Alaska Seaweed Market Assessment, 08/2021

Meticulous Research (2022): Press Release: Global Edible Insects Market. Forecast to 2030. In: meticulousresearch.com, 22.04.2022

Meynen, Gloria (2020): Inseln und Meere: Zur Geschichte und Geografie fluider Grenzen, Berlin

Mintel GNPD (Globale Neuproduktdatenbank) (2022): Weltweite Lebensmitteleinführungen mit veganer Auslobung pro Land, Januar bis Dezember 2021. In: de.mintel.com

MoneyBeach/Zixx Ltd. (2021): Top Take-outs: What are the most popular take-away choices around the world? In: moneybeach.co.uk, 11.01.2021

Oanh Ha, K. (2021): Coming Soon: Faux-Meat Burgers Made From Maggots and Mealworms. Growing numbers of producers are exploring insects as a source of protein. In: bloomberg.com, 03.12.2021

Ott, Christine (2017): Identität geht durch den Magen. Mythen der Esskultur. Frankfurt am Main

Parlasca, Martin C.; Qaim, Matin (2022): Meat consumption and sustainability; Annual Review of Resource Economics. In: annualreviews.org, 10/2022 (im Erscheinen)

Pejic-Pulkowski, Svjetlana (o.J.): Algen: Was Sie über Algen wissen sollten. In: geo.de, o.J.

planung&analyse (2022): Generation Z: Sind das wirklich die entschlossenen Klimaaktivisten? In: horizont.net, 17.02.2022

POSpulse GmbH (2019): Studie zu Lieferdiensten. In pospulse.com

RethinkX (2019): Rethinking Food and Agriculture 2020–2030. The Second Domestication of Plants and Animals, the Disruption of the Cow, and the Collapse of Industrial Livestock Farming. In: rethinkx.com, 9/2019

Rützler, Hanni; Reiter, Wolfgang (2018): Wie Holts Zukunftsvision doch noch Realität wird. In: M. Holt, Vincent; Rützler, Hanni; Reiter, Wolfgang; Wagner, Christoph: Die kleinen Delikatessen: Warum nicht Insekten essen? Wien

Smart Protein Project (2021): What consumers want: A survey on European consumer attitudes towards plant-based foods, with a focus on flexitarians. In: smartproteinproject.eu

Siemssen, Sirko; Lierow, Michael (2019): Sustainable Retail In Grocery. In: oliverwyman.com, 2019

Sinek, Simon (2009): Start with Why. How Great Leaders Inspire Everyone to Take Action. London

Sonnenberg, Ann-Kathrin (2021): Fleischersatz: Zwei von fünf Deutschen haben schon einmal Tofu gegessen, In: yougov.de, 15.06.2021

Stanton, John L. (2018): A brief history of food retail. In: British Food Journal, Nr. 120/1, S. 172–180

Statista (2021): Pflanzliche Alternativ-Produkte sind jetzt Mainstream. In: Statista Global Consumer Survey, 12.2021

The Good Food Institute (2022): 2021 State of the Industry Report: Fermentation. In: gfi.org

von Thadden, Elisabeth (2021): Unsere Grenzziehungen zwischen Natur und Kultur sind überholt. Interview mit Corine Pelluchon. In: zeit.de, 10.04.2021

Waldfogel, Joel/National Bureau of Economic Research (2019): NBER Working Paper Series: Dining out as cultural trade. Working Paper 26020. In: nber.org, 6/2019

Wharton, Rachel (2021): The TikTok Feta Effect: Cheese suppliers have been swept up in the video recipe phenomenon known as baked feta pasta. In: nytimes.com, 26.02.2021

Wrap (2022a): Helping people to reduce fresh-produce waste: Modelling the impact of selling products loose or in packaging. In: wrap.org.uk, 24.02.2022

Wrap (2022b): Helping people to reduce fresh produce and dairy waste: Citizen insights on the influence of packaging and date labels on disposal decisions. In: wrap.org.uk, 24.02.2022

Zühlsdorf, Anke; Jürkenbeck, Kristin; Schulze, Maureen; Spiller, Achim (2021): Politicized Eater: Jugendreport zur Zukunft nachhaltiger Ernährung. Wissenschaftliche Studie der Zühlsdorf + Partner Marketingberatung und des Lehrstuhls „Marketing für Lebensmittel und Agrarprodukte“ der Universität Göttingen im Auftrag der Heinrich-Böll-Stiftung. Göttingen

Zukunftsinstitut (Hg.) (2013): Hanni Rützlers Food Report 2014. In Kooperation mit der Lebensmittel Zeitung. Frankfurt am Main

Zukunftsinstitut (Hg.) (2014): Hanni Rützlers Food Report 2015. In Kooperation mit der Lebensmittel Zeitung. Frankfurt am Main

Zukunftsinstitut (Hg.) (2015): Hanni Rützlers Food Report 2016. In Kooperation mit der Lebensmittel Zeitung. Frankfurt am Main

Zukunftsinstitut (Hg.) (2016): Hanni Rützlers Food Report 2017. In Kooperation mit der Lebensmittel Zeitung. Frankfurt am Main

Zukunftsinstitut (Hg.) (2017): Hanni Rützlers Food Report 2018. In Kooperation mit der Lebensmittel Zeitung. Frankfurt am Main

Zukunftsinstitut (Hg.) (2018): Hanni Rützlers Food Report 2019. In Kooperation mit der Lebensmittel Zeitung. Frankfurt am Main

Zukunftsinstitut (Hg.) (2019): Hanni Rützlers Food Report 2020. In Kooperation mit der Lebensmittel Zeitung, foodservice und gvpraxis. Frankfurt am Main

Zukunftsinstitut (Hg.) (2019): Neo-Ökologie. Der wichtigste Megatrend unserer Zeit. Frankfurt am Main

Zukunftsinstitut (Hg.) (2020): Hanni Rützlers Food Report 2021. In Kooperation mit der Lebensmittel Zeitung, foodservice und gvpraxis. Frankfurt am Main

Zukunftsinstitut (Hg.) (2021): Hanni Rützlers Food Report 2022. In Kooperation mit der Lebensmittel Zeitung, foodservice und gvpraxis. Frankfurt am Main

zukunftsInstitut

The Zukunftsinstitut was founded in 1998 and has had a decisive influence on trend and future research in Germany from the very beginning. Today, it is recognised as a leading international point of contact for questions on the development of the economy and society.

The organisation explores the question of which changes, which trends and megatrends, are shaping our present and what conclusions can be drawn from them for the future of the economy and society. Its main objective is to make change tangible and understand the future as an opportunity.

Cooperation partners

Lebensmittel Zeitung

Lebensmittel Zeitung is the leading trade and business medium of the consumer goods industry in Germany. Independent and well-founded, it provides decision-makers with exclusive news and quality journalism. Thus it offers unique access to the industry to its readers and advertisers.

In addition to the weekly print edition of the Lebensmittel Zeitung, **LZ MEDIEN** comprises its digital news and social media channels, the POS-media of Lebensmittel Zeitung direkt as well as various industry events and congresses.

Gastronomic specialist media of the dfv media group

foodservice

The trade magazine **foodservice** conducts well-founded analyses for the entire professional gastronomy market in Germany, Austria and Switzerland.

gvpraxis

As a trade magazine for professional large-scale and institutional caterers **gvpraxis** offers a comprehensive overview of the business, care and education market sectors in the world's German-speaking countries.

The portfolio of gastronomic specialist media includes the websites **FOOD SERVICE** and **gvpraxis,** the online portal for the out-of-home market and various industry events and conferences.