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Major trade fair for baked goods iba Düsseldorf and 1. International conference on insects “InsectsPlus”

While sustainability and resource efficiency have been the main focus in the past, the current trade fairs show that connectivity, transparency, and AI integration will be the focus in the future.

The year 2025 features a multitude of trade fairs and conferences. FOOD-Lab was present at the IBA, among other events. Z. Sadyk, Food Editorial Solutions, FES, reports firsthand in this issue.

Organized by DIL Osnabrück and ATB Potsdam, InsectsPlus was the first internationally well-attended conference and exhibition on insect rearing and the production and use of insect protein, which took place in Cloppenburg from May 12-14. For many in Europe, it may still be somewhat unusual to consider consuming insect protein as a completely natural component of food. In Asia, they are already significantly more advanced, as demonstrated by the high proportion of participants from Asia. Essentially, insect rearing can be organized just like any conventional farm where cows and pigs are kept, with a few significant differences: feed and energy consumption are lower, biomass production is very efficient, and fecal disposal is also less complex. You just have to be willing to break away from traditional ways of thinking. In the accompanying exhibition, the industry offered everything required for this relatively new branch of agricultural production in Europe and its preparation and processing into food and feed. FOOD-Lab was there.

The next major trade fairs are Drinktec, September 15-19, in Munich, and Fachpack, September 23-25, in Nuremberg.

There will also be numerous symposia, such as the 13th Fresenius Online Conference Pesticide Residues in Food (July 1-2) and the 14th Fresenius Hybrid Conference Residues of Food Contact Materials in Food (October 6-7, Düsseldorf).

Also included in this issue: M. Jakob, LECO, emphasizes the importance of modern automated DUMAS nitrogen analysis compared to the classic Kjeldahl method; V. Pham and Prof. Dr. M. Gänzle, University of Alberta, CA, report on strain-level persistence of bacteria in food and food processing facilities.

I hope you enjoy reading this issue.
If you have any questions, please write or call.

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Best regards

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Innovation meets craftsmanship

A look back at iba 2025 in Düsseldorf

How will the baking industry position itself in 2025, between the art of baking and automated production? Which trends, technologies, and raw materials will shape tomorrow's manufacturing? **iba**, which took place in Düsseldorf from May 18 to 22, 2025, offered insights into an industry undergoing change – with new ideas, solutions, and many questions about the future of the bakery industry.

The magnet for innovations – the iba. FOOD TRENDS AREA. A highlight at iba 2025 in Düsseldorf. Source: GHM

Author: **Zhanar Sadyk**, Food Technologist, M. Sc. and Independent Technical Journalist Email: sadyk@food-editorial-solutions.de

iba 2025 took place this year in Düsseldorf from May 18 to 22. As an international trade fair for the bakery and confectionery industry, it offered a comprehensive overview of current developments, technical innovations, and market trends. According to official figures, the event attracted approximately 49'115 visitors from 149 countries. 985 exhibitors from 46 nations presented their products, solutions, and services on an exhibition space of 100`000 square meters.

The trade fair was accompanied by an extensive program of specialist events and lectures. Around 50 presentations with 70 speakers took place at the iba.FORUM and iba.STAGE. Topics ranged from the role of enzymes in baking processes to the automation of traditional manufacturing processes and applications of artificial intelligence. Topics such as clean label and vegan raw materials were also addressed.

In addition to the lecture program, several competitions were held, which also contributed to the structure of the trade fair. Michael Kress (Germany) was crowned the winner of the World Bread Sommelier Championship. The iba UIBC Cup of Bakers was won by the French team of Corentin Molina and Yannis Thouy. In the confectionery category, Seok Kim and Kyung Joo Jang (Korea) secured first place in the iba UIBC Cup of Confectioners. Sebastian Brücklmaier and Yannik Dittmar won the German Master Bakers Championship.

Award ceremony for the iba UIBC Cup of Confectioners at iba 2025 in Düsseldorf. The winner is Team Korea with In Seok Kim and Kyung Joe Jang. Source: GHM

Some exhibition areas were presented in more detail. The new iba.FOOD TRENDS AREA was dedicated to current developments such as plant-based ingredients, natural flavors, and innovative textures. The iba.DIGITALISATION AREA presented software solutions and digital business models, while the iba.CONFECTIONERY TEC AREA focused on technological developments for the confectionery industry. The iba.START UP AREA showcased young companies with innovative approaches for the industry.

The mochi donut balls from backaldrin. Source: backaldrin

At Loryma's booth at iba 2025, visitors were able to sample protein-enriched, vegan muffins. Source: FES

Functional baking ingredients as a trend at iba

iba 2025 showcased the nutritional topics currently shaping product development in bakeries and confectioneries. The focus was on gluten-free and vegan alternatives, high-fiber ingredients, and new flavors. At the same time, demand for recipes with less sugar and fat without neglecting flavor is increasing. Interest in regional raw materials and transparent origins has also continued to grow.

Zeelandia GmbH & Co. KG, headquartered in Frankfurt/Main, is part of the international Royal Zeelandia Group and is one of the manufacturers of baking ingredients in Germany. The company offers highly functional ingredients and customized application solutions for bread, rolls, and fine baked goods. At iba 2025, Zeelandia presented its portfolio of products and concepts focused on freshness, naturalness, and clean labels as part of the iba.FOOD TRENDS AREA. To mark the company's 125th anniversary, the trade fair presence was a showcase of long-standing expertise combined with current innovative strength.

"We are delighted to be part of iba 2025 and to showcase our expertise in the field of baking ingredients. Our presence at the iba.FOOD TRENDS AREA perfectly matches our commitment to innovation and our understanding of our customers' needs," said Robert de Baets, Head of Industry Europe.

backaldrin International, headquartered in Asten near Linz (Austria), operates in around 130 countries countries worldwide and is one of the leading suppliers of baking improvers, sourdoughs, fillings, and specialty mixes for commercial and industrial bakeries. At iba 2025, the company presented the following new products: Whole Wheat 30% is a functional mix for the easy production of high-fiber baked goods that meets the trend toward healthy eating. The MochiMagicMix enables the production of donut balls with a crispy shell and elastic crumb – a product that is particularly aiming at younger trend-conscious customer groups. The Viennese Brandy Mix enables the efficient and reliable production of classic choux pastry products such as cream puffs or éclairs. The "baking without proofing" innovative technology presented here enables production without the traditional proofing phase and promises energy savings, process reliability, and simplified handling.

Loryma, a brand of the Crespel & Deiters Group based in Zwingenberg, DE develops functional wheat ingredients for the food industry. At iba 2025, the company presented ingredient solutions for vegan, nutritionally optimized snacks and baked goods, including egg and milk substitutes, protein- and fiber-rich recipes, and surface finishing products. "The bakery industry faces significant opportunities in selected segments that can specifically drive business," explains Norbert Klein, Head of R&D at Loryma. The products are aimed at increased processing reliability, improved nutritional profiles, and attractive product appearance.

Digitalization and automation trends in the baking industry

Digital technologies increase efficiency, simplify processes, and improve communication with customers and employees. AI-based applications relieve staff, boost sales, and support more environmentally friendly operations.

AHA360°, based in Gersthofen (Bavaria), specializes in shopfitting, interior design, and lighting planning, particularly for businesses in the bakery, restaurant, and food retail sectors. At iba 2025, AHA360° presented a new AI-supported

At the AHA 360° booth, Max Mosig, Head of Marketing, demonstrates how store employees can send verbal inquiries directly to the new AI assistant. Source: FES

assistance solution for retail stores. The digital store assistant is designed to support everyday processes – for example, during onboarding, staff development, or overcoming language barriers. Other areas of application include reducing fluctuation, improving internal processes, and structured customer communication. The system was developed as a practical addition to reduce staff workload and increase store efficiency. The company also set up an AHA Light Cube at its booth to showcase a new lighting solution for baked goods.

The ongoing shortage of skilled workers is accelerating the demand for automated processes in the baking industry. Customized technological solutions are becoming increasingly important – especially in conjunction with AI-supported robotics. This can not only make production processes more efficient but also contribute to ensuring consistent product quality. At iba 2025, numerous machine and system solutions were presented, including those from the manufacturer König Maschinen, which are specifically designed to optimize work processes.

WP Kemper GmbH, based in Rietberg, has been developing bakery machines for artisanal and industrial applications for over 100 years. With Kairos, the company pursues a data-driven approach to process optimization and quality assurance – from dough production to the reduction of production waste. At iba 2025, WP Kemper GmbH presented KAIROS, a kneading machine that is consistently prepared for the use of artificial intelligence. The system collects and analyzes data from the kneading process, detects deviations, and provides recommendations for action – for example, regarding dosage or kneading time. The goal is automated process control that responds flexibly to changing conditions, such as personnel or raw materials. The "Kairos AI" platform forms the technological basis for continuous learning and adaptive control.

Baking New Ways: Perspectives, Partnerships, Potential

Over five days, iba 2025 in Düsseldorf offered the international baking industry a compact overview of current developments – from traditional methods to digital process solutions. The focus was on professional exchange and targeted business development. According to the organizers, 62.6 percent of visitors had decision-making authority, which made the trade fair particularly attractive for providers of technical solutions.

"Regardless of time and place, iba has impressively demonstrated that it stands for quality and international relevance, bringing together the right protagonists from all over the world in one place. The Düsseldorf location also provided fresh impetus: It tapped into new target groups from neighboring regions and countries, both nationally and internationally," emphasized Dieter Dohr, Chairman of the Management Board of GHM Gesellschaft für Handwerksmessen. The lasting impact of these impulses on the industry will become apparent at the latest at the next iba in 2027 in Munich, when the trade fair will take place again in its regular three-year cycle – against the backdrop of ongoing challenges such as digitalization, sustainability, and the shortage of skilled workers.

Award ceremony for the German Bakers' Championship at iba 2025: The winners are Sebastian Brücklmaier and Yannick Dittmar. Surrounded here by Roland Ermer, President of the Central Association of German Bakers (left), and jury member Andreas Schmitt (right). Source: GHM

With almost 9.000 businesses, around 235.000 employees, and a total turnover of €17.92 billion, the German bakery trade is one of Germany's most important economic factors. The Central Association of the German Bakery Trade (ZDB), based in Berlin, actively advocates for the interests of the bakery trade, creates better framework conditions, and promotes the training and continuing education of bakers. "We are committed to the future of the bakery trade in Germany," says Roland Ermer, President of the Central Association. With the campaign "Bake Your Future", the association provides information about career opportunities and supports both training companies and apprentices – for example, with a logbook app. Since January 2025, the "Azubi Campus" has been available to apprentices – a digital platform with tutorials for exam preparation. "Demographic change is also leading to a shortage of skilled workers in the skilled trades. That's why the topic of promoting young talent is particularly close to my heart," emphasizes Ermer. The trainee workshop also took place over four days at iba, offering young people practical insights into the trade and contributing to their in-depth professional knowledge.

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Protein determination at low nitrogen levels

Author: **Michael Jakob**, European Field Product Manager, LECO Instrumente GmbH, michael_jakob@leco.com

In addition to moisture, fat, carbohydrates and fiber content, the standard parameters of food analysis also include proteins. Protein determination is routinely performed on a large scale. Several analytical methods are available for this purpose: In addition to NIR/NIT rapid methods, the reference methods according to Dumas and Kjeldahl are primarily used. Although both processes have been known for over 100 years, the Kjeldahl wet chemical method was considered the standard until the end of the 20th century – despite considerable disadvantages in terms of time, costs, occupational safety and environmental impact. Since the late 1980s, the combustion-based Dumas method has established itself as an equivalent reference, among other things due to its efficiency and environmental advantages.

The determination of low concentrations is a particular challenge in chemical analysis. While products such as meat, cheese, grains or fish have nitrogen levels of 1–15%, these are in the range of less than 100 ppm or less for samples such as starch, beer, filtrates or filter carriers. In the following, the performance of two Dumas systems in the determination of low nitrogen contents is comparatively presented.

The Dumas analysis is based on the complete combustion of the sample, the reduction of the resulting nitrogen oxides to molecular nitrogen (N_2), the removal of interfering associated gases and the quantitative determination of the nitrogen by means of thermal conductivity detection. The sample weights used typically vary between several 100 mg and over 3 g. Compared to the Kjeldahl method, the Dumas analysis offers significant advantages: a significantly shorter analysis time (currently from 2.8 minutes compared to several hours), a higher recovery rate and lower ongoing operating and disposal costs due to the minimal use of chemicals.

Against this background, a comparative performance test of two Dumas systems from Leco (FP828 and FP928) is carried out. Both devices rely on combustion of the sample in a high-temperature furnace under pure oxygen, which achieves extensive independence from the sample matrix. The main difference lies in the type of sample introduction: The FP828 model uses tin foils, gel capsules, or tin capsules, while the FP928 model uses high-volume ceramic or metal boats. In both systems, the resulting combustion gases are first collected in a ballast volume, from which a defined aliquot (optionally 3 or 10 cm³) is taken for further analysis. Interfering gases such as CO_2 and SO_2 are chemically bound by suitable absorbents. In a catalytic furnace with heated copper, the nitrogen oxides are reduced and excess oxygen is removed. Water is previously separated via a thermoelectric cooler. By using a small aliquot and efficient gas processing, up to 4,000 analyses can be performed with one set of chemicals.

To investigate the performance of both systems in the low concentration range, samples with correspondingly low nitrogen contents were specifically selected.

FP828P

Five repeat measurements were performed for the analysis of the powder samples. The samples were weighed in different capsule types: 250 mg in LECO tin capsules, 300 mg in small gelatin capsules and 400 mg in medium gelatin capsules. The system was calibrated using

FP828 and FP 929 Dumas Systems with capsules/boats

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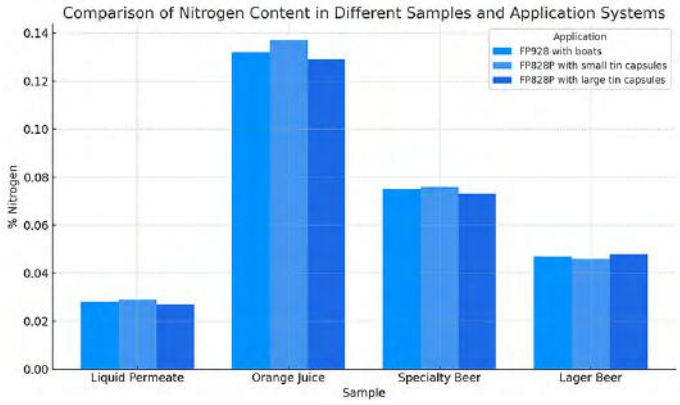


Figure 1: Results powder/solid samples: nitrogen contents

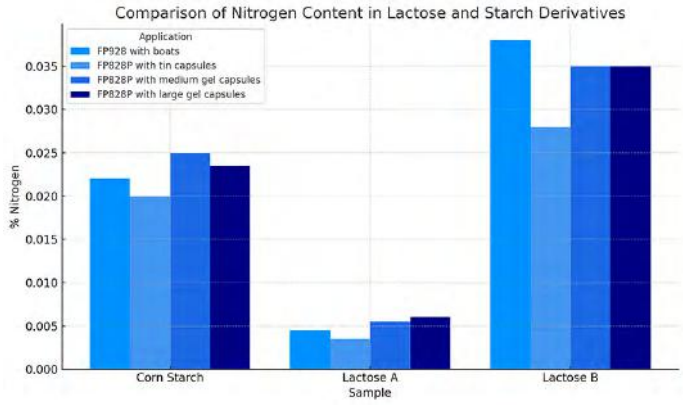


Figure 2: Comparative measurements of solid samples

a strength standard (LECO 502-912) with a declared nitrogen content of 755 ppm.

The liquid samples were also analyzed in fivefold determination. Two capsule sizes were used: small tin capsules with a weight of 300 mg and large tin capsules with 500 mg. The calibration was carried out using an ammonium solution (LECO 502-602) with a nitrogen content of 0.1002%.

FP928

In this system, the samples were placed in ceramic boats with a weight of about 1 g. Calibration was carried out in the same way as for the FP828P with either the strength standard (LECO 502-912) or the ammonium solution (LECO 502-602), depending on the sample material. For the analysis of liquid samples, the boat was equipped with a nickel insert to ensure stable sample pick-up. Alter natively, there is the possibility of using metal boats.

When looking at the powder samples, it can be seen that the measurement results show good agreement despite different device concepts and application methods. Even in the low concentration range around 50 ppm, both high comparability and satisfactory precision are given (see table below). As expected, the boat system of the FP928 shows a high level of performance due to the higher sample mass a slightly lower standard deviation than die FP828P capsule methods.

Atmospheric blanking is the distorting influence of molecular atmospheric nitrogen, which is inevitably included when airtight tin capsules are sealed. This proportion can influence the measurement result and must therefore be quantified by analyzing nitrogen-free reference samples – for example, finely ground sugar in analytical quality. The blank values determined in this way can be subtracted from the measurement results on the software side.

This effect is negligible when using open sample carriers such as ceramic boats, open gelatine capsules or liquid samples, as there is no complete capsule sealing and thus no relevant atmospheric nitrogen is trapped

As expected, the liquid samples are somewhat more precise than the powder samples due to the higher homogeneity. Here, too, the slightly better precision of the 928 system with its higher weights is evident.

Result

Both Dumas analyzers show good comparability and the required analytical precision in the low nitrogen range. The applications shown can be reliably carried out on both the LECO FP828 and the FP928 with shuttle system. Liquid samples tend to have better reproducibility than solid samples due to their higher homogeneity and the lack of atmospheric blank values. As expected, precision improves as sample weight increases, regardless of the sample matrix.

Table 1: Standard Deviations for Liquid and Solid Samples

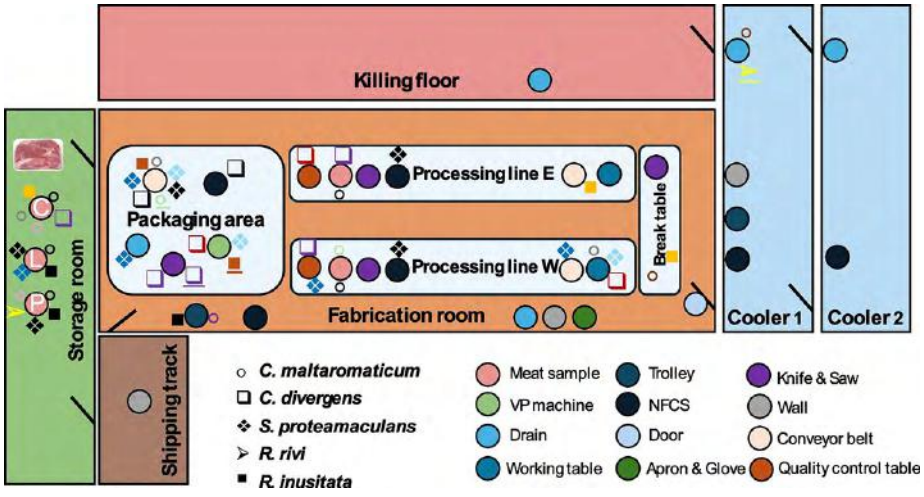
Solid/powder-shaped samples				
	FP928 Combustion Boat	FP828P Tin foils	FP828P Medium Gel Capsules	FP828P Small Gel Capsules
Cornstarch	0,0002	0,0016	0,0006	0,0009
Lactose A	0,0027	0,0019	0,0007	0,0017
Lactose B	0,0002	0,0008	0,0008	0,0017

Liquid samples			
	FP928 Combustion Boat	FP828P Small tin capsules	FP828P Large tin capsules
Liquid Permeate	0,0002	0,0006	0,0024
Orange juice	0,0002	0,0061	0,0019
Special beer	0,0001	0,0025	0,0007
Lager beer	0,0004	0,0016	0,0014

Strain level persistence of bacteria in food and food processing facilities

Photo: Adobe Stock

Authors: **Vi Pham** and **Michael G. Gänzle** University of Alberta, Dept. of Agricultural, Food and Nutritional Science

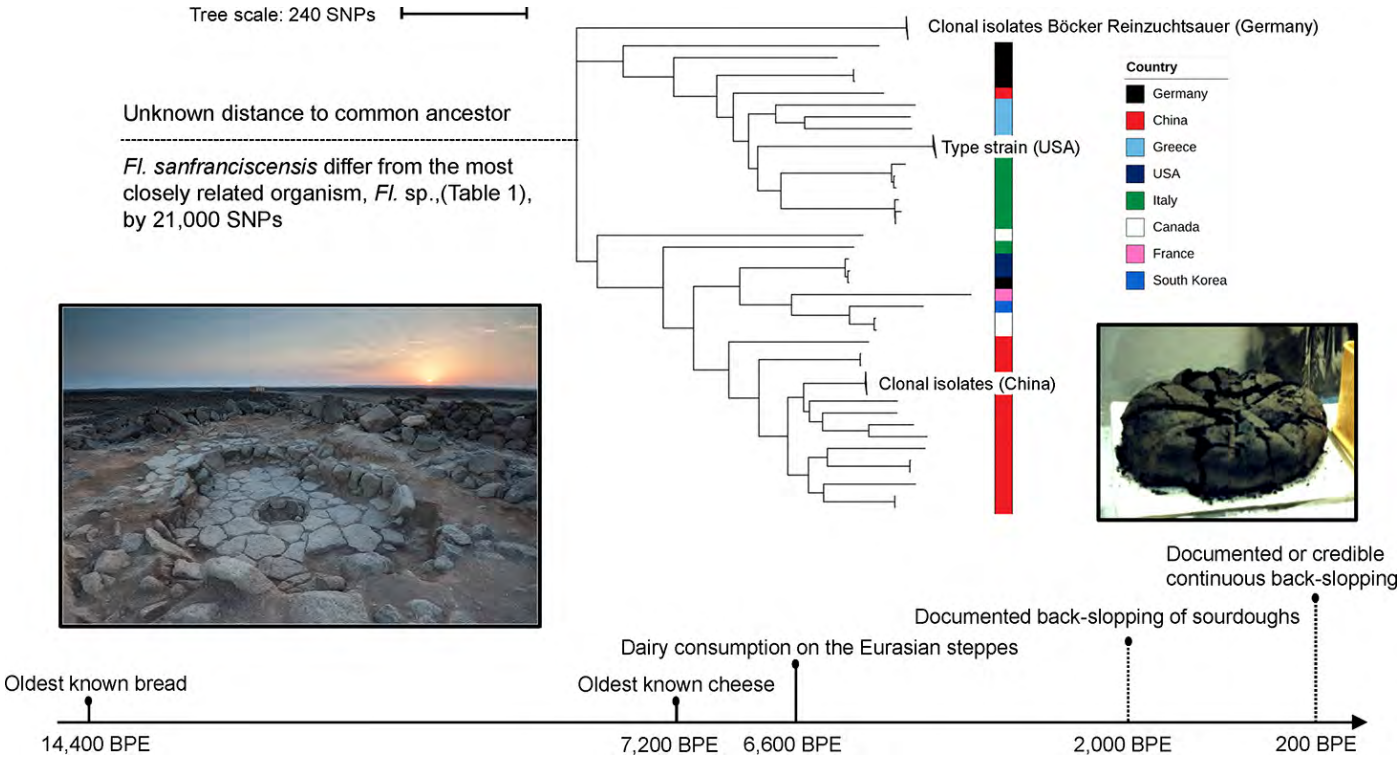


Distribution of meat spoilage-associated isolates across various sampling sites from a meat processing facility. The symbols represent different bacterial species: C. maltaromaticum (◦), C. divergens (❑), S. proteamaculans (❖), R. rivi (➢), and R. inusitata (■). The type of sampling site is color coded as in the figure. Underlined symbols denote isolates collected after cleaning and sanitation. Only isolates with fewer than 10 SNPs are shown. Isolates of the same strain dispersed across the facility are labeled with the same color symbols. FCS, food contact surfaces; NFCS, non-food contact surfaces. Processing line E operates muscle meat samples including leg, collar, and picnic, while processing line W is mainly for tenderloin and loin meat. Source: BioMed Central Ltd – https://doi.org/10.1186/s40168-024-02026-1

When consuming food, we almost invariably consume bacteria – the good, fermentation microbes and probiotics, the bad, food-borne pathogens or their toxins, and the ugly, spoilage microbes. Assuring food quality and safety necessitates control of which bacteria are associated with food. This precipitates the question: where do they come from?

Understanding how communities of organisms assemble is facilitated by Mark Vellend's ecological theory, which uses four classes of processes: Dispersal, referring to the movement of organism to the ecological niche; selection, referring to displacement of one organism by a more competitive organism; speciation, referring to adaptation of an organism to the ecological niche; and drift, referring to random events that fundamentally change the niche.

Raw plant foods are invariably associated with bacteria. Plants live in association with microbes that colonise the surface (phyllosphere), the roots (rhizosphere), or live inside the plants as endophytes. Bacilli, Pseudomonaceae, Enterobacterales and, at much lower cell counts,



(Upper panel) Unrooted SNP tree including all genomes of *Fl. sanfranciscensis* that were available on National Center for Biotechnology Information in July 2024 . The most closely related species to *Fl. sanfranciscensis* differs by 27,000 SNPs. (Lower panel) Documented (solid lines) and possible (dotted lines) timelines for baking, cheese production, dairy consumption on the Eurasian Steppes, back-slopping of sourdoughs, and continuous back-slopping of a sourdough. The picture to the lower left shows one of the fireplaces where bread-like remains were found (published under a Creative Commons license; the picture on the right shows a bread that was buried in Pompei during the eruption of the Vesuvius in 79 A.D. (picture courtesy of the authors). Source: American Society for Microbiology ("ASM") – https://doi.org/10.1128/aem.01892-24

lactic acid bacteria including lactococci, *Leuconostoc*, *Weissella* and *Enterococcus* species are part of the plant microbiome. In addition, animals, dust or water may carry contaminants on the plants. The U.S. Food and Drug Administration has recently identified irrigation water and dust as vectors that carry microbes including enterohaemorrhagic *Escherichia coli* to fresh produce produced in the South-West of the U.S.. In Florida, irrigation water is a source of contamination with *Salmonella enterica* – waterways in Florida are home to alligators which, like other reptiles, are colonised by *Salmonella*.

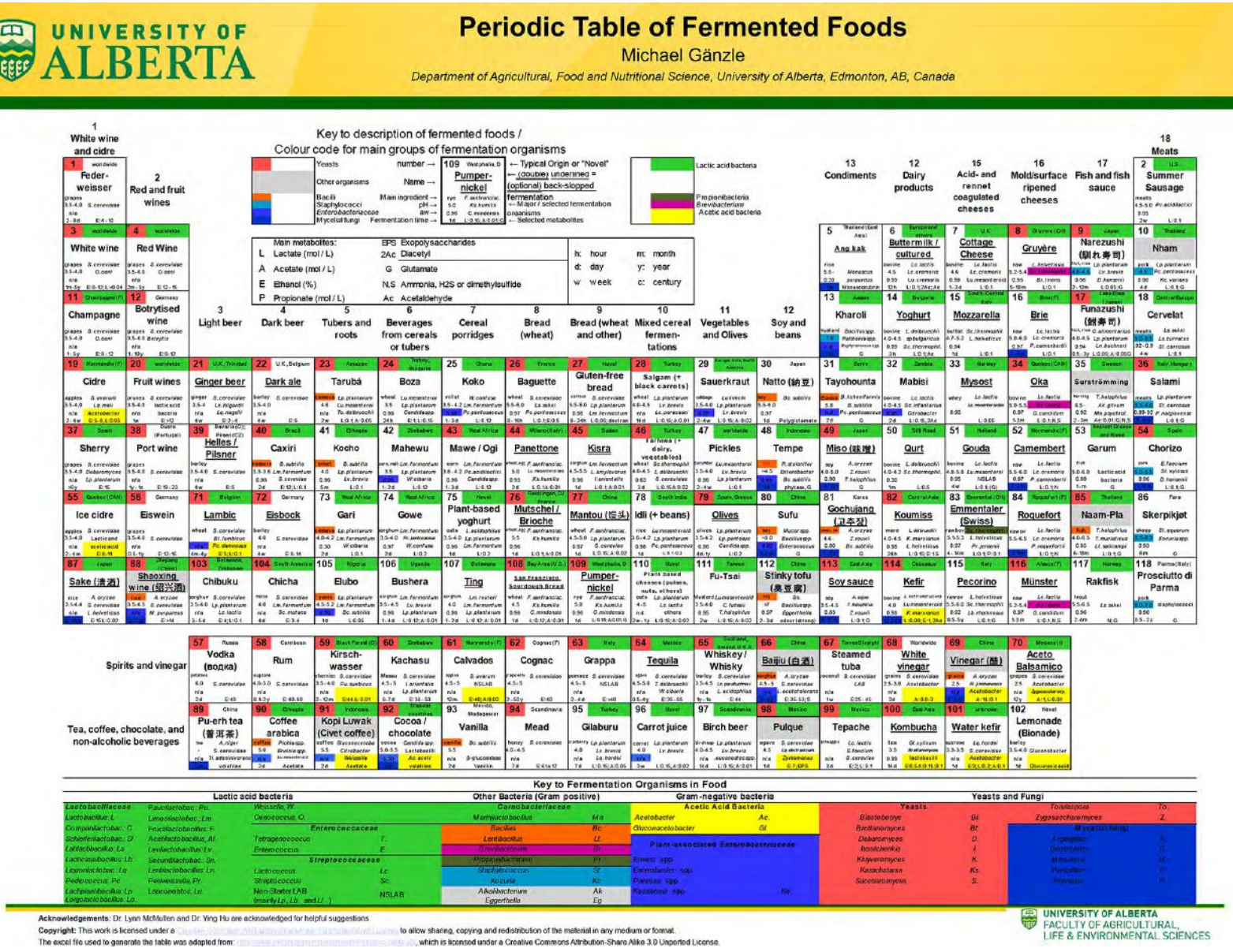
When plant foods are fermented without addition of starter cultures or back-slopping, i.e. the addition of a small part of a previous batch of products, fermentation is limited by dispersal and initiated by plant microbiota. Lactic acid bacteria, particularly *Lactiplantibacillus plantarum* and *Levilactobacillus brevis* eventually prevail even though their initial numbers are very low because they are most acid resistant.

Animal food products are contaminated during production. The muscles of animals are sterile, and milk is produced in mammary glands that are also sterile unless infected. Here, bacteria residing on meat or in milk result from contamination during milking, slaughter and processing. In the case of fermented foods, bacteria are deliberately added, either by back-slopping with a part of a previous batch of product, or as starter culture.

How do we know where the bacteria come from, or whether or not bacteria permanently persist in food processing facilities, in back-slopped food fermentations? In other words, how do we know that a bacterial strain isolated from a batch of romaine lettuce originates from a feedlot, where a comparable strain was isolated? How do we know whether bacterial isolates from a sourdough, or yoghurt, are offspring or isolates from the same fermentation that were obtained decades earlier? This is not an easy answer as only few studies document how fast bacterial genomes evolve in nature. To add insult to injury, the rate of bacterial evolution is dependent on the circumstances – bacteria in a stable environment evolve more slowly than bacteria that are transferred to different environments.

When growing, the bacteria replicate their genetic material to distribute the genome to two offspring cells. A mutation happens when the cell mistakenly copies a wrong building block, resulting in a genome with a different nucleotide when compared to the original genome. Such a different is termed a single nucleotide polymorphism (SNP). The number of SNPs, can determine the relatedness between the mother cell and the offspring cell. Finding the number of SNPs is a challenging task.

The method with the highest accuracy is whole-genome sequencing, the process of decoding or reading every building block of the bacterial genetic material. In recent years, advances in technology have greatly reduced the cost of genome sequencing. Currently, the cost of sequencing has been reduced to €1 per Gbp or € 10 – 100 per bacterial genome. DNA sequencing, however, is not error free. Once the building blocks have been decoded, bioinformatic tools determine the SNPs between two bacteria and conclude on their relatedness. The analysis tools have continued to develop but have not achieved absolute accuracy. When determining the relatedness of two bacteria by counting the number of SNPs, even one error in a single building block is signifi-

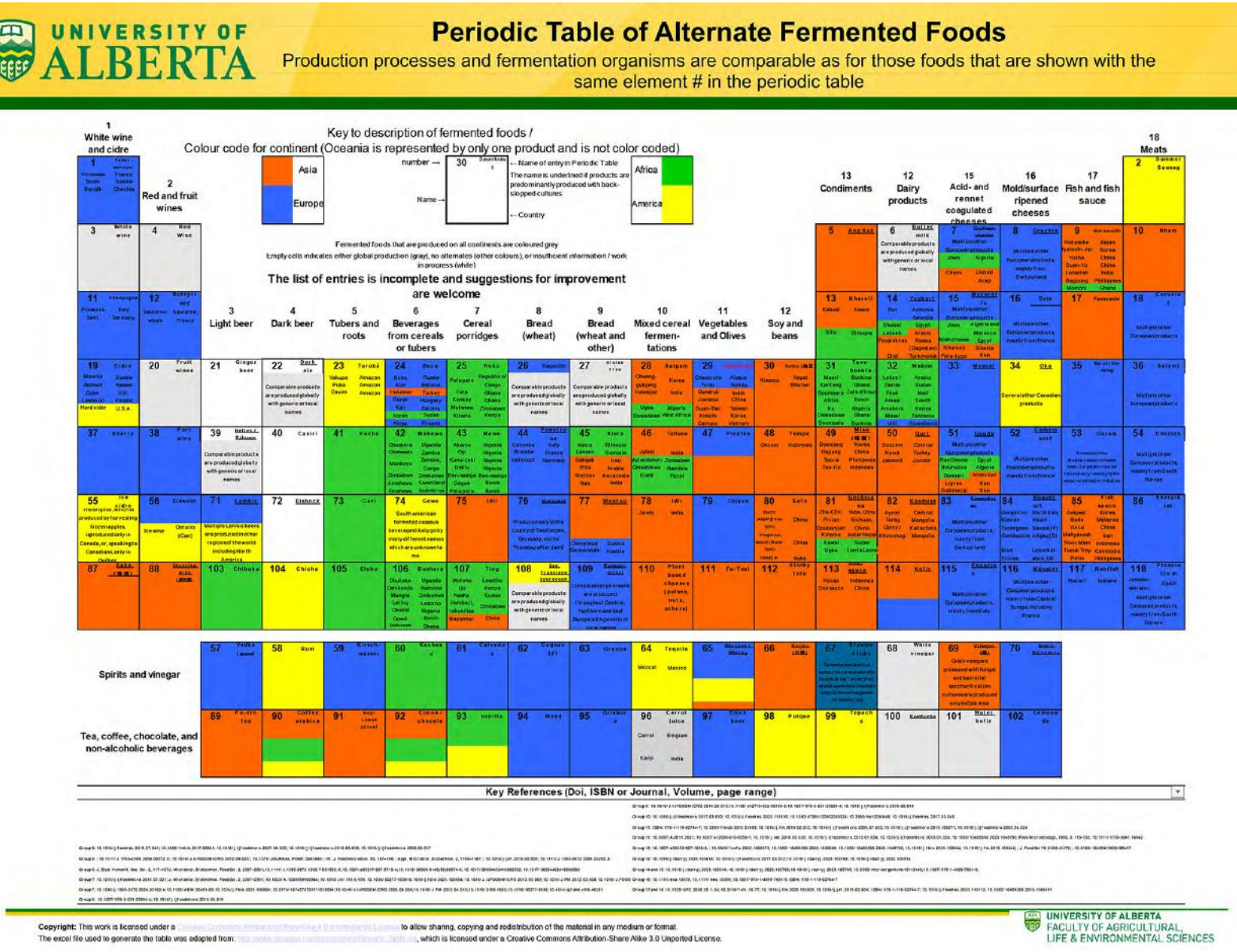


cant. Although current technology cannot provide completely error-free results, knowledge and experience can achieve a nearly perfect SNP count. Current sequencing platforms and bioinformatic tools identify all but five to ten of 2,000,000 – 5,000,000 nucleotides in bacterial genomes correctly. When two genomes differ in fewer than 10 – 20 SNPs, they are very likely to share a very recent common ancestor.

Using SNP count to determine the relatedness of bacteria has been applied in several areas. In epidemiology, government agencies such as the European Survey of Carbapenemase-Producing Enterobacteriaceae (EuSCAPE) have used the number of SNPs to determine the relatedness of the pathogens identified in patients and transmission within and among hospitals. Likewise, in investigations of outbreaks of foodborne disease, the number of SNPs is used to determine whether bacteria isolated from patients originate from specific foods and food processing facilities. This information helps to trace the origin of the food pathogens. In outbreak investigations, a threshold of 21 SNPs identifies the origin of food-borne pathogens with high likelihood.

SNP analyses were also used to document persistence of food-borne pathogens in food processing facilities. Persistence in the food-processing environment is best documented for *Listeria monocytogenes*. More than a dozen studies identified persisting strains of *L. monocytogenes* in food processing facilities by documenting strain-level identity of isolates obtained more than three month apart. Moreover, surveillance data indicates that about 40% of the food processing facilities in North America and Europe are colonized by persisting strains of this pathogen. The longest period of observation spans 17 years, concluding that strains of *L. monocytogenes* entered the facility as it opened in the 1970ties and remained in the facility ever after. In most foods, successful control of *L. monocytogenes* is thus not mainly dependent on limiting access to the facility but on elimination of persisting strains.

Does the concept of persisting microbes also apply to spoilage microbes? The question was recently answered and it was answered with "yes". All, absolutely all, bacterial strains that were isolated from vacuum-packaged primal pork cuts at the end of their 3 month shelf life were also isolated from the processing facility (fig. 1). Again, the genomes of the bacterial isolates obtained from meat at the end of the shelf life and the genomes of the isolates from the processing facility in two samplings conducted 5 month apart differed by fewer than 10 SNPs, making the conclusion that the for-



mer are offspring of the latter the most likely explanation. A floor drain in the cooler for the pig carcasses and the packaging machine were identified as the hot spots of persisting bacterial communities that contaminate meat and eventually result in spoilage. As persisting microbes limit the shelf life of the product, sanitation and hygienic design or, in ecological terms, an increased selective pressure to keep microbes under control, are key to improve product quality and shelf life. The facility that was investigated, though, stopped operations after a major fire in the plant; here, drift disrupted the persistence of the bacterial communities.

Do microbes persist in back-slopped food fermentations? Sourdough is one of the fermented foods that is maintained for years by mixing a bit of mother sourdough with fresh flour and water every day. Most sourdoughs are much older than the bakers that maintain them. Comparing the genomes of isolates that were obtained years apart informs on whether the same strain persists in the same sourdough over time. This question was also answered with yes: Although bakers don't work in a sterile environment, with recurrent contamination from flour, the bakery environment and other sources, three out of four sourdoughs maintained the same strains over periods of 3 – 20 years. When considering the history of fermented foods, it is entirely possible, if not likely, that sourdough bacteria, particularly *Fructilactobacillus sanfranciscensis*, were domesticated: The organisms adapted to rapid growth in sourdough (speciation) and all bakers in the world, in China, the Near East, Europe, and North America, work with offspring of the same strain that was domesticated a couple of thousand years ago and then distributed globally. In addition to sourdough microbes, bacteria occurring in back-slopped dairy fermentations including *Lc. lactis*, *Lc. cremoris*, *Lactobacillus delbrueckii* subsp. bulgaricus and *Lactobacillus kefiranofaciens* are likely also domesticated. These organisms are used for fermentation of cheese, yogurt and kefir (Periodic Table and periodic table of alternates). The genomes of *L. kefiranofaciens* that were re-constructed from a 3,500 old archaeological sample clustered ancestral to contemporary isolates, supporting the concept of domestication and global distribution.

We thus start to understand where microbes in food come from. Some carry over from the raw material, plants; some contaminate from the intestines of animals, some persist in food processing facilities for years or even decades. Understanding of how dispersal, selection, speciation and drift shape bacterial communities in food will allow to produce more safe, shelf stable food.

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More than 350 people participated in the first InsectsPlus congress

Author: **Thomas Kützemeier**, info@mcongressconsult.de

Insects Plus Congress 2025

Focus on Alternative Protein Sources

How can the world be fed sustainably? This question was the focus of the very first Insects Plus Congress in Cloppenburg, Germany, which brought together over 350 experts from more than 30 nations from May 12 to 14, 2025. Whether from insects, algae, or microorganisms: Under the motto "Sustainable Protein Supply of the Future," science, business, politics, and civil society discussed current developments and innovative solutions relating to alternative proteins and biomass utilization.

Organized by the German Institute of Food Technologies (DIL) in cooperation with the Leibniz Institute of Agricultural Engineering and Bioeconomy (ATB), the congress provided a platform for interdisciplinary exchange. More than 60 expert presentations and practice-oriented workshops explored topics such as the circular economy, consumer acceptance, digital transformation, and regulation. In addition to its scientific depth, the congress also impressed with its strong practical relevance: Over 25 exhibitors, including companies such as Better Insects Solutions and Andritz, presented innovative technologies and solutions for the production and processing of alternative biomass. The program was complemented by excursions to regional industrial facilities.

"Alternative protein sources are not only an opportunity for economic growth, but also a key to reducing the burden on our planet," emphasizes Dr. Heinz, Managing Director of the DIL and co-founder of the congress. "By developing new solutions for sustainable nutrition, we secure our resources and create new markets."

Dr. Oliver Schlüter, Program Director for Healthy Food at ATB, summarizes: "The large number of participants demonstrates how sustainable solutions for high-quality proteins are gaining importance – be they technological, logis-

Science in Dialogue: Over 70 posters invited participants to engage in professional exchange.

tical, or political. Only when research, business, and politics work together can we implement innovative technical solutions to effectively close cycles. This first Insects Plus Congress lays the foundation for valuable collaboration between all stakeholders."

Three awards for outstanding achievements were presented at the event. The Insects Plus Young Scientist Poster Award went to Laura Weißenborn from the Technical University of Dresden for her scientific work. The award for the best young scientist presentation went to Panagiota Soulioti from the University of Thessaly in Greece, who impressed the expert jury with her presentation. The Best Startup Pitch Award went to Jonathan Robertz from MicroHarvest GmbH in Hamburg. The jury consisted of Lucas Hoyos (Rentenbank), Anna Hartmann (Niedersachsen.next), and Prof. Dr. Kemal Aganovic (DIL German Institute of Food Technology).

Dr.-Ing. Volker Heinz (DIL; right) and Dr.-Ing. habil. Oliver Schlüter (ATB) present the Insects Plus Young Scientist Poster Award to Laura Weißenborn from TU Dresden.

Following the successful launch of the new Insects Plus series, the congress will be held every two years at different locations. A continuation is planned for 2027 under the leadership of the ATB in the capital region.

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- Alternatives to PFAS in plastic
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The Experts

Zainab Al Harraq European Food Safety Authority (EFSA) | **Thomas Behnke** Institut Kirchhoff, Mérieux NutriSciences | **Stefanka Bratinova** European Commission Joint Research Centre (JRC) | **Juan-Carlos Carrillo** Shell International | **Laurence Castle** formerly Fera Science | **Riccardo Crebelli** formerly Italian National Institute of Health (ISS) | **Thomas Letzel** Analytical Institute for Non-Target Screening | **Claudia Lorenz** German Federal Institute for Risk Assessment (BfR) | **Maricel Marin-Kuan** Nestlé Research | **Peter K. T. Oldring** Sherwin Williams | **Max Schneider** PTS – Institut für Fasern & Papier | **Dieter Schrenk** University of Kaiserslautern-Landau | **Thomas Simat** Technische Universität Dresden | **Dennis Snelders** Danone Nutricia Research | **Lionel Spack** Nestlé | **Natalie Stark** State Institute for Chemical and Veterinary Control (CVUA) Stuttgart | **Monika Tönnießen** Henkel | **Hares Wahdat** LyondellBasell Industries

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