



# CATALYSE

Catalysing scientific innovation into food safety action

## Science in Action: Exploring New Frontiers in Food Safety

8<sup>th</sup> June 2026

Helena Stoffers, Agroscope



Co-funded by  
the European Union

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Federal Department of Economic Affairs,  
Education and Research EAER  
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Research and Innovation SERI



UK Research  
and Innovation

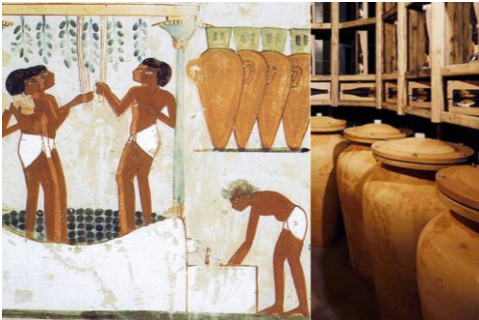
This project has received funding from UK  
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# From Fermentation to Forecasting: The New Food Safety Toolbox

1901 Swiss Dairy Research Station .....

**7000 BC -  
Ancient Era**

Fermentation of beer, wine, bread, cheese and yogurt



Humans use microbes without understanding them

**1665 - 1676**

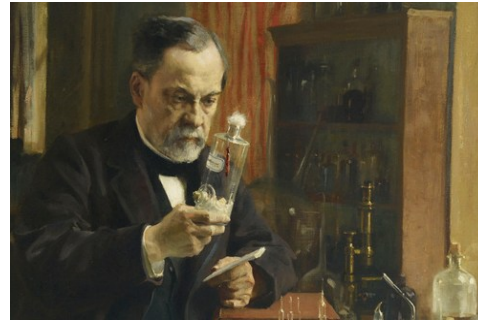
First observation of microorganisms by Antonie van Leeuwenhoek



Discovery of the microbial world

**1857 - 1864**

Louis Pasteur explains fermentation

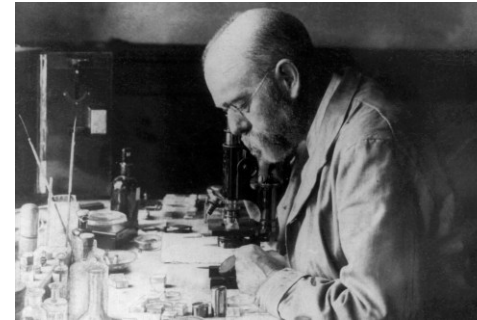


L. Pasteur

Fermentation becomes science

**1860s**

Industrial Fermentation evolves  
Pasteurization and germ theory

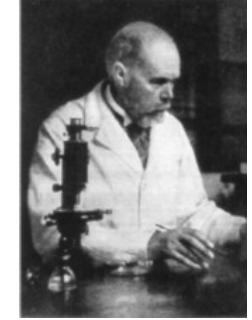


R. Koch

Evidence-based food preservation

**1870 - 1950**

Pure cultures, selective media, industrial microbiology



S. Orla-Jensen



E. Von Freudenreich

Microbial quality control begins

# From New Analytical Methods to Predictive Microbiology



Agroscope Dairy Section

1950 - 1990

1983 - 2005

2005 - 2015

2015 - Present

Future

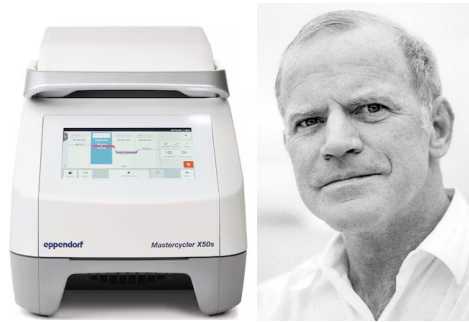
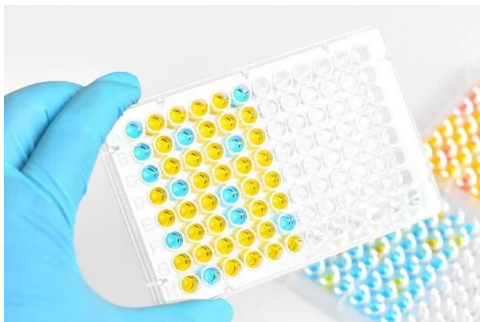
Serology, ELISA, HACCP, rapid testing

PCR and molecular epidemiology

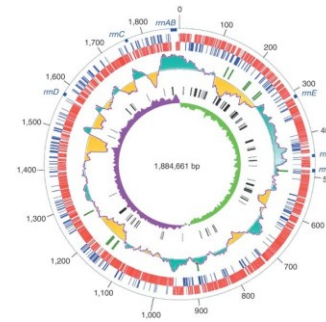
Whole Genome Sequencing (WGS)

Metagenomics, biosensors, AI

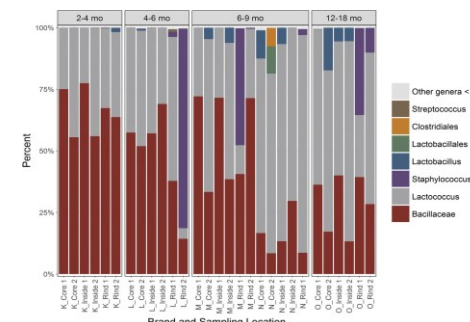
Predictive microbiology, machine learning, digital twins



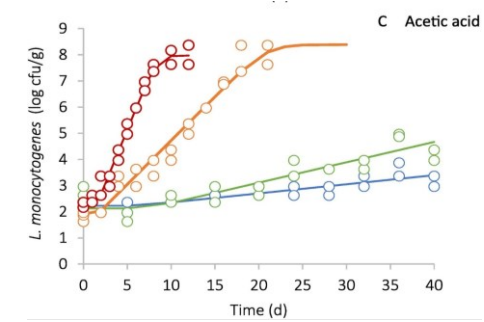
K. Mullis



*Lactobacillus sakei*, 2005  
Nature Biotechnology



Salazar et al. (2018)



De Boer et al. (2025)

Faster detection and preventive food safety

Rapid pathogen and outbreak identification

Global strain tracking and source attribution

Monitoring entire microbial communities

Predicting contamination before it occurs



Salazar, J. K., Carstens, C. K., Ramachandran, P., Shazer, A. G., Narula, S. S., Reed, E., Ottesen, A., & Schill, K. M. (2018). Metagenomics of pasteurized and unpasteurized gouda cheese using targeted 16S rDNA sequencing. BMC Microbiology, 18, Article 189

de Boer, P., Serra-Castelló, C., Berendsen, L., Zwietering, M. H., & Nierop Groot, M. N. (2025). A model food mimicking plant-based meat analogues for determination of matrix effects on growth of *Listeria monocytogenes*. International Journal of Food Microbiology, 443.

Picture sources: <https://www.euroimmun.pl/> / <https://www.eppendorf.com/> / <https://guides.library.nymc.edu/> / [www.nature.com/](http://www.nature.com/)

[www.thecatalyseproject.eu](http://www.thecatalyseproject.eu)

# New Challenges Calls for New Solution

10:50 | **From Fermentation to Forecasting: The New Food Safety Toolbox** - *Helena Stoffers, Agroscope*

11:00 | **Fermentation against *B. cereus* in Plant-Based Foods** - *Verena Looser, Agroscope*

11:20 | **Targeted Protective Cultures for Cheese** - *Emmanuelle Arias, Agroscope*

11:40 | **Biological Destruction of the Forever Chemicals PFAS** - *Fabienne Kurt, CellX Biosolutions*

12:00 | **Predictive Microbiology for Safer Food** - *Cristina Serra-Castelló, Wageningen University & Research, NL*

12:30 | **Lunch Break**



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## Thank you for your attention!

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**State Secretariat for Education,  
Research and Innovation SERI**



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