

KATHARINA JULIA BRENNER

INDUSTRIAL PROCESS MODELER | BIOENGINEER | PHD CANDIDATE

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PROFESSIONAL SUMMARY

Industrial process modeler and bioengineer building quantitative, plant-wide models for complex manufacturing systems. Work spans bioprocess scale-up, mass and energy balances, digital twins, techno-economic analysis, life-cycle assessment, uncertainty, and data-driven decision support.

PROFESSIONAL AND ACADEMIC EXPERIENCE

PhD Candidate and Scientific Staff 2023 - Present

Technical University of Munich - Cellular Agriculture

- Develop quantitative models of industrial biomanufacturing processes from unit operation to facility level.
- Connect process design, scale-up, utilities, TEA, LCA, digital twins, and engineering decision support.

Founder 2024 - Present

Future Foods at TUM

- Build an interdisciplinary community across sustainable food, advanced technologies, research, and entrepreneurship.

Class of Fall 2017 2017

Center for Digital Technology and Management (CDTM)

- Completed interdisciplinary innovation and technology-management work alongside a foundation in business administration.

SELECTED TECHNICAL WORK

Cultivated Meat Process Model 2026

Open research platform

Plant-wide model from media preparation through packaging, with complete mass and energy balances, utilities, scenarios, and an interactive public interface.

BioTA - Bioreactor Technical Analysis Open source

Open modeling workflow

Workflow for bioreactor yield prediction and operating-point optimization, designed toward richer time-dependent models and future CFD coupling.

CORE COMPETENCIES

Process systems: plant-wide simulation, mass and energy balances, facility architecture, utilities, bottleneck analysis | **Scale-up:** bioreactors, process design, scenarios, TEA, LCA | **Digital engineering:** Python, data science, AI, digital twins, decision tools | **Analytical foundation:** mathematics, statistics, uncertainty, optimization

SELECTED PUBLICATIONS

Decoding cultured meat manufacturing: a full process model to identify scale-up bottlenecks. *Frontiers in Nutrition.* 2026

Waste stream valorization in cultured meat manufacturing: pathways toward circularity and sustainability. *Applied Food Research.* 2026

Bioreactor parameters and systems for cultured meat production. *Future Foods.* 2025

Technology and processes for cultivated meat. *Ernahrungs Umschau.* 2025

AFFILIATIONS AND RECOGNITION

Selected stations: Cambridge, TUM, CDTM, Bayerische EliteAkademie, LMU, Stanford, KAIST, TUM Venture Labs

Recognition: Deutschlandstipendium (2022); Lothar-und-Sigrid-Rohde-Stiftung (2021); Bayerische EliteAkademie, Class of 2017

Languages: German, English