

Jingnan Zhang

ORCID: <https://orcid.org/0000-0002-4865-5212>

jingnan.zhang801@outlook.com

Research Interests

Plant protein structuring, AI-driven texture prediction in meat analogs, Computational food mechanics (FEA, CFD), Food by-products valorization, Sustainable food systems and circular bioeconomy.

Education

- **PhD in Food and Nutrition Science**, Chalmers University of Technology, Sweden (2023)
- **MSc in Food Technology**, Wageningen University, Netherlands (2018)
- **BEng in Food Science and Engineering**, China Agricultural University, China (2016)

Professional and Research Experience

Huazhong Agricultural University, China

Researcher, 2024.4 – Present

- Exploring the integration of AI and computational modeling in sustainable food systems, with a current focus on plant-based meat structuring.
- Initiated work on physics-informed neural networks (PINNs) to enhance the prediction of plant protein textural properties during processing.
- Applied FEA, CFD and soft matter physics to simulate food material behavior under thermo-mechanical processing, supporting rational design of fibrous textures in meat analogs.
- Contributing to AI-based screening of bioactive compounds for clean-label food preservation.
- Investigated techno-economic and societal aspects of food loss and waste (FLW) reduction, with emphasis on converting underutilized biomass and side streams into valuable protein-rich ingredients.

Chalmers University of Technology, Sweden

Postdoctoral Researcher, 2023.6 – 2024.4

- Led research on the gelation and structuring of protein isolates derived from herring and salmon by-products, incorporating natural antioxidants from food side streams and seaweeds during extraction.
- Applied rheological and textural analyses to elucidate structure–function relationships within the resulting protein gel networks.

PhD Student, 2019.5 – 2023.6

- Developed the “cross-processing” strategy to co-valorize marine and agricultural food side streams, producing stable and nutritious fish protein isolates with improved water solubility, gelling capacity, and emulsifying properties suitable for structured food applications.
- Engaged in interdisciplinary collaborations on sensory evaluation (with RISE), environmental life cycle assessment (with Chalmers-TME), and food 3D printing (with TNO, Netherlands), expanding the technological and sustainability dimensions of the research.
- Built a solid foundation in sustainable protein research by integrating food chemistry, processing technologies, and systems-level approaches.

DSM Food Specialties, Netherlands

R&D Trainee, 2017.8 – 2018.6

- Designed and conducted a screening study using three DSM commercial enzymes and sixteen lactic acid bacteria strains to produce flavoring ingredients from three European seaweed species. The process involved enzymatic hydrolysis, followed by fermentation of the resulting hydrolysates.
- Collaborated with fermentation and sensory science teams to evaluate flavor development and optimize processing conditions for potential food applications.

Teaching Experience

Huazhong Agricultural University, China

Researcher, 2024 – Present

- Supervised PhD students Wei Luo and Mengyue Zhou on literature reviews published in *Trends in Food Science & Technology* (Q1, IF 15.1), focusing on enzyme valorization from food by-products and AI-driven enhanced screening of natural antimicrobials for clean-label food preservation, respectively.

Chalmers University of Technology, Sweden

Postdoctoral Researcher / PhD Student, 2019 – 2023

- Supervised three MSc theses on sustainable protein production from food by-products using the cross-processing approach, including Anna Aronsson (main advisor), Pearly Teo Huiyi (secondary advisor), and Bovie Hong (main advisor).
- Served as laboratory supervisor (2019–2022) in core food science courses: *KLI011 Food Chemistry* and *KLI042 Nutrition, Health, and Sustainable Diets*.
- Delivered a guest lecture (Dec 2023) in *KLI011 Food Chemistry*, focusing on the practical application of food chemistry in sustainable product design, featuring the cross-processing concept as a case study.

Professional Service & Leadership

• Lead Guest Editor of Special Issues

- *Food Chemistry: X* (2025): "Advancing In Vitro Digestion Research in Food Chemistry"
- *Food and Humanity* (2024): "Bioactive Compounds in Emerging Food Resources: Extraction, Characterization, and Health Benefits"

• Associate Editor, *Food Biomacromolecules* (Wiley) (2024.2 – Present)

• Editorial Board Member, *Food and Humanity* (Elsevier) (2024.2 – Present)

• Session Chair, 2024 AOCS Annual Meeting

Session: "Effects of Lipid and Protein Oxidation on Plant-Based Ingredient and Food Quality"

• Scientific Peer Reviewer (2023 – Present)

Reviewer for leading journals including *Trends in Food Science & Technology*, *Food Hydrocolloids*, *Food Chemistry* and *Food Research International*. Completed 102 reviews as of 2025.4.

Awards & Scholarships (Selected)

- Chalmers Research Fund, 34,000 SEK, sole applicant (2024)
- Honored Student Award, American Oil Chemists' Society (AOCS) (2023)
- Chalmers Research Fund, 35,000 SEK, sole applicant (2023)
- Chalmers Biosciences Graduate School PhD Student Grant: 16,000 SEK (2023)
- Student Award of Travel Grant, AOCS Annual Meeting & Expo (2022)
- LiFT Sweden, PhD Student Grant: 15,000 SEK (2022)
- IVA-100 List (Royal Swedish Academy of Engineering Sciences) (2020)
- Adlerbertska Foreign Student Hospitality Foundation Scholarship: ~6,000 SEK/year (2020 – 2024)
- Holland Scholarship: 5,000 EUR (2018)
- Mars Scholarship: 6,000 CNY (2015)
- Cargill Global Scholarship: 1,250 USD per year (2013 – 2016)
Included a 2-year mentorship program and leadership training workshop in Shanghai, China, and at Cargill's global headquarters in Minneapolis, USA.

Conference Presentations

Delivered 12 oral and poster presentations at major international conferences across Europe, North America, and Asia, showcasing research in sustainable food systems, protein structuring, and food by-product valorization. Key events include:

- American Oil Chemists' Society (AOCS) Annual Meeting & Expo (2021 – 2024, USA & Canada)
- World Congress of Ocean (2023, Japan)

- Euro Fed Lipid Congress and Expo (2021, Online)
- Food Science Sweden Conferences and Symposiums (2020 – 2023, Sweden)

Certifications

- MITx- 6.86x: Machine Learning with Python-From Linear Models to Deep Learning (2022)
- Wenell Management- Applied Project Management course (2019)

Other Leadership & Service Roles

- **Co-Host**, *Chalmers PhD Alumni Event* (2024)
- **Invited speaker**, “Women in Research” Campaign held by Eurodoc (2023)
- **Board Member**, *Swedish National Student Union – Doctoral Committee (SFS-DK)* (2022 – 2023)
- **Vice-Chair**, *Chalmers Doctoral Students Guild (DS)* (2022 – 2023)
- **Co-Organizer**, *Chalmers PhD Alumni Event* (2022)
- **Student Representative**, *Chalmers BIO FoFu Committee* (2021 – 2023)
- **Division Representative**, *Chalmers BIO&K Department PhD Council* (2021 – 2023)
- **Board Member**, *Chalmers Doctoral Students Guild (DS)* (2021 –2022)

Publications

Total number of publications (since 2020): 20 (13 as first author, as of 2025.4)

Peer-reviewed journal articles:

1. **Zhang, J.**, & Wu, H.* (2025). Valorization of bioactive compounds from food by-products using supercritical fluid extraction: A technological and industrial perspective. *Food Chemistry*. *In press*. (Q1 in Food Science, IF 8.5).
2. **Zhang, J.** & Zhu, H.* (2025). Finite element analysis as a promising approach for texture development of plant-based meat analogs. *Physics of Fluids*. [DOI](#) (Q1 in Physics, Fluids & Plasmas, IF 5.0)
3. Zhou, M., Lima, J. C. R., Zhao, H., **Zhang, J.**, Xu, C., Júnior, C. D. S., & Wu, H.* (2025). Harnessing AI for enhanced screening of antimicrobial bioactive compounds in food safety and preservation. *Trends in Food Science & Technology*. [DOI](#) (Q1 in Food Science, IF 15.1)
4. Luo W.†, **Zhang, J.**†, Ahmmed, M.K., Sakai, K., Shahidi, F., Zhi Z.*, & Wu, H.* (2025). Valorization of animal by-product enzymes: Advancing sustainable food processing through innovative extraction, purification, and application strategies. *Trends in Food Science & Technology*. [DOI](#) †Equal contribution. (Q1 in Food Science, IF 15.1)
5. **Zhang, J.***, Hong, B., Abdollahi, M., Wu, H., & Undeland, I. (2024). Role of lingonberry press cake in producing stable herring protein isolates via pH-shift processing: a dose response study. *Food Chemistry: X*. [DOI](#) (Q1 in Food Science, IF 6.5)
6. Lei, X., Wu, H.*, Liu, L.*, **Zhang, J.**, & Undeland, I. (2024). Mechanistic insights to the strong antioxidative capacity of lingonberry press cake during recovery of fish protein ingredients. *Future Foods*. [DOI](#) (Q1 in Food Science, IF 7.2)
7. **Zhang, J.***, & Li, Y. (2024). Berry pomace as a potential ingredient for plant-based meat analogs. *Food Biomacromolecules*. [DOI](#) (Invited paper to the inaugural issue)
8. Wu, H.*, Sakai, K., **Zhang, J.**, & McClements, D.J. (2024). Plant-based meat analogs: Color challenges and natural colorants. *Food, Nutrition and Health*. [DOI](#) (Invited paper to the inaugural issue)
9. **Zhang, J.**, Ahmmed, M.K., Regenstein, J.M., & Wu, H.* (2024). Recent advances of recycling proteins from seafood by-products: Industrial applications, challenges, and breakthroughs. *Trends in Food Science & Technology*. [DOI](#) (Q1 in Food Science, IF 15.1)
10. **Zhang, J.***, Abdollahi, M., Ström, A., & Undeland, I. (2023). Lingonberry (*Vaccinium vitis-idaea*) press-cake as a new processing aid during isolation of protein from herring (*Clupea harengus*) co-products. *Food Chemistry: X*. [DOI](#) (Q1 in Food Science, IF 6.5)

11. R. V. Coelho, C., Peters, G.*, **Zhang, J.**, Abdollahi, M., & Undeland, I. (2023). Fish beyond fillets: life cycle assessment of cross-processing herring and lingonberry co-products into a food product. *Resources, Conservation and Recycling*. [DOI](#) (Q1 in Environmental Sciences, IF 13.2)
12. **Zhang, J.***, Ström, A., Bordes, M., Alminger, M., Undeland, I., & Abdollahi, M. (2023). Radial discharge high shear homogenization and ultrasonication assisted pH-shift processing of herring co-products with antioxidant-rich materials for maximum protein yield and functionality. *Food Chemistry*. [DOI](#) (Q1 in Food Science, IF 8.8)
13. R. V. Coelho, C., Peters, G.*, **Zhang, J.**, Hong, B., Abdollahi, M., & Undeland, I. (2022). A comparative life cycle assessment of cross-processing herring side streams with fruit pomace or seaweed into a stable food protein ingredient. *Future Foods*. [DOI](#) (Q1 in Food Science, IF 7.2)
14. **Zhang, J.***, Abdollahi, M., Alminger, M., & Undeland, I.* (2022). Cross-processing herring and salmon co-products with agricultural and marine side-streams or seaweeds produces protein isolates more stable towards lipid oxidation. *Food Chemistry*. [DOI](#) (Q1 in Food Science, IF 8.8)
15. Abdollahi, M.*, Olofsson, E., **Zhang, J.**, Alminger, M., & Undeland, I.* (2020). Minimizing lipid oxidation during pH-shift processing of fish by-products by cross-processing with lingonberry press cake, shrimp shells or brown seaweed. *Food Chemistry*. [DOI](#) (Q1 in Food Science, IF 7.5)

Conference proceedings:

16. **Zhang, J.***, Ström, A., Bordes, M., Alminger, M., Undeland, I., & Abdollahi, M. (2022). Creating functional protein ingredients by cross-processing herring co-products with lingonberry press-cake, shrimp shells, or green seaweed. *Journal of The American Oil Chemists Society*. [DOI](#)
17. **Zhang, J.***, Hong, B., Abdollahi, M., Alminger, M., & Undeland, I. (2022). Lingonberry press-cake inhibits lipid oxidation during pH-shift processing of herring co-products and subsequent ice storage of recovered protein isolates. *Journal of The American Oil Chemists Society*. [DOI](#)
18. **Zhang, J.***, Abdollahi, M., Alminger, M., & Undeland, I. (2021). CROSS- a clean label concept for preventing lipid oxidation of protein isolates recovered from fish by-products. *Journal of The American Oil Chemists Society*. [DOI](#)

Book chapter:

19. **Zhang, J.**, Günal-Köroğlu, D., Echeverria, E., & Subasi, B.G. (2025). Recent advances in valorization of wastes and by-products of berry processing and food applications. In A.C Karaca & E. Capanoglu (Eds.), *Berry Fruits* (pp. 343-383). Academic Press. [DOI](#)
20. Luo, W., **Zhang, J.**, & Wu, H. (2025). Lipid oxidation in meat: From fundamental mechanisms to latest control solutions. In F. Toldrá (Eds.), *Advances in Food and Nutrition Research*. Academic Press. *In press*.

Thesis:

21. **Zhang, J.** (2023). Cross-processing fish co-products with plant food side streams or seaweeds using the pH-shift method. (Doctoral dissertation, Chalmers University of Technology, Gothenburg, Sweden).

Manuscripts (Selected):

22. Wu, H.†, **Zhang, J.†**, ..., Willer, D.* Technological advances reduce food loss in fish post-harvest value chain. †Equal contribution. *Ready for submission to Nature Food* (Q1 in Food Science, IF 23.6).
23. **Zhang, J.**, & Zhu, H.* Computational fluid dynamics analysis of thermal stokes flow in 3D food printing of plant protein inks. *To be submitted to Physics of Fluids* (Q1 in Physics, Fluids & Plasmas, IF 5.0)