

ELENA KEULEYAN

Ph.D. student & MSc in Food Science

What sets me apart is my strong belief in **food science** to contribute to a more **sustainable** food system. I leverage my **creativity** alongside my scientific expertise to effectively communicate my insights on **biochemistry** and **nutritional fate** of foods.



Nantes, France



26 years-old



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EXPERIENCES

oct. 2021–oct. 2024 – Ph.D. candidate - INRAE, Research Unit: Biopolymers, Interactions & Assemblies Nantes, France
Food emulsions stabilized by plant protein ingredients obtained via mild fractionation: From formulation to digestion.

The aim of my project is to explore the **functionalities** of commercial **plant protein ingredients** from **pea** and **lupin** (isolates and concentrates) to tailor their **emulsifying** properties. I characterized the composition, and interactions between their proteins and endogenous lipids at the oil-water interface using deep microscopy techniques and interfacial rheology methodologies. Finally, I analyzed the **digestive fate** of the formulated emulsions and managed to link its microstructure with its nutritional properties.

The results of my Ph.D. will help the Food Science community to overcome the complexity of plant protein ingredients to design sustainable and nutritious foods for tomorrow.

Project management, strategic planning, literature review, research paper design and writing (planned to be up to 7 articles), biochemical analyses, physicochemical properties measurements, problem-solving, resilience, teamwork, creativity, presentation skills, scientific mediation

2020–2021 – Research Assistant - INRAE, Research Unit: Animal Products Quality Clermont-Ferrand, France
Investigation of the chemical reactivity of nitrite-preserved processed meats during digestion.

- Dynamic *in vitro* digestions of dry-cured sausages using the DIDGI® device, results published in 2022
- Biochemical assays implementations and optimisation. Student supervision (2 months, BTEC Higher National Diploma in Biotechnology)
- Delivered 6 conferences at scientific meetings (engaging 20 processed meat companies, 4 research units, 2 technical institutes) (*online*)

2019 – Engineering Assistant Internship – HYES, St-Pierre Azif, France (3 months)
Development of four spreadable condiments with fresh spirulina.

- Realization of the prototype phase of the project: formulation, market analysis, supplier relations, equipment acquisition
- Daily harvests of spirulina and on-site processing: extrusion, drying, packaging (craft production)
- Management of farm visits and sales (ranging from one to three times a week; with groups ranging from 2 to 30 people)

2018 – Internship – St-Michel, St-Michel Chef Chef, France (1 month) Production line work and analysis of working conditions.

EDUCATION

2024 – Management for Ph.D. students - Nantes, France (40 hours)

Fostering team collaboration; Understanding your personality to understand your collaborator's using enneagram; Cultivating your creativity and implementing design thinking in a company; Handling crisis, an approach through serious games; Management for the future

2017–2020 – MSc degree - Oniris, Food science and technology engineering school – Nantes, France
Specialization: Nutrition and Food science

2020 – MSc Thesis – INRAE, Animal Products Quality Research Unit, Clermont-Ferrand, France

Design of an emulsified *in vitro* model to screen the chemical reactivity induced by polyphenols and vitamins during digestion: An application to processed meat. Publication of the results in 2021.

Aug. – Dec. 2018 - University of Helsinki, Helsinki, Finland

Master Programme in Food Science, of which: Sustainability science; Food Processing Technology; Approaches in research on food-related behaviour; French course assistant for master students

SKILLS

LANGUAGES

French (*native*)
English (*C2 fluent*)
Spanish (*C1 advanced*)

IT

ImageJ (image analysis)
iMovie (video design)
R (beginner)

EXPERTISE

PLANT PROTEIN FUNCTIONALITY

FOOD COLLOIDS

EMULSION SCIENCE

BIOPOLYMER–SURFACE INTERACTIONS

IN VITRO DIGESTION

HOBBIES

BAKING

Self-taught, I graduated with a Certification of Pastry Chef Diploma (2020)

PIANO (11 years)

PAINTING, DRAWING (*watercolor*)

HIKING

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EXTRA - ACTIVITIES

2023 – Paris international agricultural show

Preparation of lab activities and presentations of work involving plant proteins, foams and emulsions

2021-2023 – Young researchers representative at the INRAE - BIA Research Unit Council

2017-2018 – Oniris' art department manager & member of Engineer without Frontiers



SIDE JOBS

2019 – Technician - Eurofins

Responsible for receiving and managing food and biological samples logistics.

2017-2019 – Private teacher - Complétude

Mathematics, physics and chemistry (11th and 12th grades) and spanish (5th grade)

RESEARCH ARTICLES (4)

Mar. 2024 – One article submitted for publication in *Journal of Colloid and Interfacial Science*, and four in progress.

2023 – F. Guéraud et al., Effects of sodium nitrite reduction, removal or replacement on cured and cooked meat for microbiological growth, food safety, colon ecosystem, and colorectal carcinogenesis in Fischer 344 rats. *npj Science of Food*, 10.1038/s41538-023-00228-9.

2023 - E. Keuleyan et al., Pea and lupin protein ingredients: New insights into endogenous lipids and the key effect of high-pressure homogenization on their aqueous suspensions. *Food Hydrocolloids*, 10.1016/j.foodhyd.2023.108671

2022 - E. Keuleyan et al., In vitro digestion of nitrite and nitrate preserved fermented sausages – New understandings of nitroso-compounds' chemical reactivity in the digestive tract. *Food Chemistry: X*, 10.1016/j.fochx.2022.100474

2021 - E. Keuleyan et al., Design of an in vitro model to screen the chemical reactivity induced by polyphenols and vitamins during digestion: An application to processed meat. *Foods*, 10.3390/foods10092230

ORAL COMMUNICATIONS (7)

2024 – E. Keuleyan et al., – American Oil Society Chemistry (AOCS) Annual Meeting & Expo (Montréal, Canada) Endogenous lipids: disregarded co-passengers shaping the emulsifying and interfacial properties of pea and lupin protein ingredients. **Winner of the 2024 European Student Travel Grant (750€)**

2023 – E. Keuleyan et al., – Inno'Sweet, CRT AGIR (Pessac, France) Emulsifying properties of pea and lupin protein ingredients: role of endogenous lipids and functionalization of their aqueous suspensions

2023 – E. Keuleyan, J. Kergomard, A. Boire, E. David-Briand, V. Vié, A. Meynier, A. Riaublanc, C. Berton-Carabin – Euro Fed Lipids (Poznan, Poland) Interfacial and emulsifying properties of pea and lupin protein ingredients: A pivotal role of endogenous lipids?

2023 – E. Keuleyan et al., – ICEF14, International Congress on Engineering and Food (Nantes, France) Interfacial properties of pea and lupin protein ingredients: a pivotal effect of endogenous lipids and aqueous suspension pre-homogenization

2023 – E. Keuleyan et al., – Journées CHEVREUL 2023, Société Française pour l'étude des Lipides (SFEL) (Paris, France) Endogenous lipids vs proteins from pea and lupin ingredients: Competitive affinity for the oil-water interface?

2022 – E. Keuleyan et al., – Protein Interactions & Assembly (web-conference) Pea and lupin protein ingredients: new insights into endogenous lipids and the key effect of high-pressure homogenization on their aqueous suspensions

POSTERS (4)

2024 – Sustainable Plant Protein Forum, AOCS (Montréal, Canada)

2024 – Food Colloids (Thessaloniki, Greece)

2024 – International Congress on Food Digestion (Porto, Portugal)

2023 – Member of the jury responsible for selecting the best poster awards at ICEF14 (Nantes, France)

2022 – Edible Soft Matter (Wageningen University, The Netherlands)