**Novel Sustainable Food ingredient from mushroom(s) to nourish the future with enhanced nutritional value, and textures with biotransformation and minimal processing technologies.**

**Short title: Novel Sustainable Food Ingredients from Mushrooms.**

Nestlé and the Pontificia Universidad Católica de Chile, through the Nestle-UC Research Grant, hereby open the call for applicants to the Nestlé-UC Doctoral Fellowship to support an outstanding doctoral student to conduct transformative research on projects that have the potential for real-world impact in natural sciences and engineering-related disciplines. The current call is aimed at prospective students of the Doctoral Program in Engineering and Sciences with Industry at UC Chile that are interested in working on **Novel Sustainable Food Ingredients from Mushrooms.**

**Fellowship details:**

* Fellowships will include up to four years of scholarship support for the degree of Doctor in Engineering and Sciences with Industry at Pontificia Universidad Católica de Chile.
* It is expected that the last year will be spent at Nestlé facilities in Lausanne (exact dates to be defined during project execution).
* Fellows will receive funding for research supplies and travel.
* Fellows should start March, 2025.

**Application process:**

* Candidates must submit a written application by **November 1**, 2024, including:
* 2 letters of recommendation
* CV
* Grades in their BSc course
* Applicants will be notified of the final decision by email by **November 5**, 2024
* Between the **6 and the 8 of November**, applicants must be available to be interviewed by a joint Nestlé-UC committee (remote format, in English). The preselected student will then have to submit his or her official application to the Ph.D. program in Engineering and Sciences with Industry via [Postulaciones - Dirección de Postgrado (puc.cl)](https://intrawww.ing.puc.cl/postulacionpostgrado/login.php).

**Project Description (exact final formulation will be defined jointly with supervisors at both UC and Nestlé):**

**Background:** The global food system is facing numerous challenges, including limited arable land, economic constraints, environmental concerns, and changing consumer preferences. To ensure long-term sustainability, it is crucial to explore and understand healthier, sustainable, and resilient crops and food systems. Mushrooms, as macro-fungi, (not including mycoprotein or fungi culture through fermentation) the offer a unique opportunity due to their nutritional value and potential for functional food applications. One major advantage is utilizing agricultural side-stream as a substrate for mushroom cultivation, through which the food industry can reduce waste and contribute to a circular economy. However, due to the challenge on the nutritional density, texture, flavor, mushrooms are still not used widely as a major ingredient or component in the food products.

**Objective:** This research project aims to investigate mushrooms as a sustainable food source, focusing on developing innovative processing techniques to enhance their nutritional value (nutrient density), texture, improve flavor with biotransformation and minimal processing technologies to increase their use in food product applications.

**WP1.** **Literature review and define research direction to valorize commonly used and/or under-exploited mushroom species (focus on LATAM):**

* Conduct a comprehensive analysis of the nutritional composition of common and identified mushroom species, including protein content, essential minerals, complex polysaccharides, bioactive compounds, antioxidants, unsaturated fatty acids, and vitamins.
* Review technological know-how and current state of art on the processing strategies (including biotransformation, under-utilized traditional processes) to improve the nutritional density, texture and flavor utilize to understand the white spaces in the area of mushroom research.
* Identify variety and species of mushrooms and propose research direction to deliver the potential benefits.

**WP2. Enhance the texture and sensory attributes of mushrooms to improve consumer acceptability:**

* Explore nutrient densification to improve the nutritional value and modulate texture of derived ingredients from mushrooms and making them more appealing to consumers.
* Explore texturization modulation approaches/processing technologies to create differentiated textures of derived ingredients from mushrooms and have an elevated consumer’s sensory experience.
* Investigate the impact of processing technologies including biotransformation on the sensory attributes of mushrooms/or mushroom derived ingredients, such as taste, aroma, and mouthfeel.

**WP3. Conduct a preliminary LCA (Life Cycle Assessment) for identified ingredient(s) including associated processing technologies.**