2024 Food Microbiology Conference

Emerging Researcher Profiles

Guillermo Eduardo Sedo Molina

Combinatorial lactic acid bacteria genotypical and phenotypical screening for the removal of antinutrients and off-flavours present in a pea, oat and potato blend for the generation of plant-based dairy alternatives

The antinutrients and off-flavors present in plant-based foods are the major organoleptic and consumer acceptance drawbacks considered when developing plant-based dairy alternatives. Some lactic acid bacteria strains have demonstrated to encode for enzymes that are phenotypically able to degrade or remove those, through the action of fermentation. However, there are lacks on establishing bacteria, single and combinatorial, screening (SC) platforms that could optimize the starter culture development process for plant-based dairy alternatives. Here, it is shown a combination of genotypical and phenotypical screening methods to find out the optimal combination of lactic acid bacteria strains based on off-flavors, phenolic acids, saponins and trypsin inhibitor degradation through the fermentation of a pea, oat, and potato (POP) blend. The SC platform is composed by five consecutive SC phases; genotypical SC, pH-based SC, colorimetric/growth SC, in situ POP fermentation SC and combinatorial microbiology SC.

I am a PhD student from the Technical University of Denmark in my 2nd year of the PhD program. My PhD is titled "REPLANTED: Removal of off-flavors and antinutrients present in oat, pea and potato blends by lactic acid bacteria fermentation". I have published 6 scientific articles until now, covering different aspects of LAB applied to plant-based dairy alternatives. I have a BSc in Biotechnology from the Autonomous University of Barcelona and MSc in Food Technology from the Technical University of Denmark. I have been focused in food microbiology and food fermentation since 2019, specializing in lactic acid bacteria. I have done research in 4 different universities around the globe and worked in two different food industries focusing in meat and plant products R&D and Quality Departments.

Dr Amreeta Sarjit

Transfer of Salmonella from skin to flesh and peelers during peeling of baby cucumber

Salmonella is of particular concern in the fresh produce sector. Baby cucumbers were associated with a recent Salmonella outbreak in Australia. Some consumers advocate peeling cucumbers to improve food safety. We investigated the transfer of Salmonella from skin to flesh and peelers during peeling of baby cucumbers. The transfer of Salmonella from unrinsed and rinsed cucumber skin to flesh and peelers during peeling with either a stainless-steel or plastic peeler was examined. Stainless-steel peelers are a better option, but do not eliminate the risk of Salmonella transfer during peeling of baby cucumbers.

Amreeta Sarjit holds a PhD from Curtin University and is currently a Lecturer in Microbiology and Molecular Biology in the Institute of Innovation, Science and Sustainability, Federation University's Gippsland Campus. She has a strong interest in food microbiology with a focus on bacterial pathogens such as Salmonella and Campylobacter. She is, particularly interested in the mechanisms of survival, impact of antimicrobials and genomic characteristics of these pathogens in food systems.

Sherlyn Ardion

Application of Gas Chromatography–Mass Spectrometry (GC–MS) to Detect Foodborne Pathogens

This proposed study's proof-of-concept application of gas chromatography–mass spectrometry (GC–MS) successfully identified the putative non-polar Salmonella biomarkers. With automation and further validation, it may address high-throughput testing concerns.

Sherlyn Ardison completed her Nutrition Science (Honours) degree at Deakin University in 2023, with her project focusing on the application of gas chromatography–mass spectrometry (GC–MS) to detect foodborne pathogens. Sherlyn has volunteered as a research assistant at Deakin since 2022, assisting PhD candidates in general microbiological and food safety testing and analysis. She aims to dive deeper into food safety research by pursuing an ARC HyTECH-funded PhD program at Deakin in early 2024.

Elerin Toomik

Understanding shelf-life of vacuum-packed lamb and beef through variations in microbial community and metabolome profiles

Vacuum-packed lamb shelf-life is significantly shorter than beef's making it vulnerable to loss of quality shelf-life during export transit. To understand the differences in spoilage mechanisms, the microbial community and metabolome profiles (i.e., meat nutrients and bacterial by-products) of beef and lamb were examined, revealing that the abundance of specific spoilage bacteria and metabolites increased faster on lamb compared to beef. Both also had distinct metabolome profiles, which may contribute to different shelf-lives as bacteria consume and produce different by-products. Ultimately, this knowledge may reveal opportunities for the future development to assure and/or extend the quality shelf-life.

Elerin Toomik, originally from Estonia, is currently at the end of her PhD journey at University of Tasmania. As an emerging food microbiologist, she is driven to find ways to reduce unnecessary food loss by understanding the mechanisms of microbial food spoilage. Her doctoral work investigates the dynamic changes in both microbial community and surface metabolites of meat as they relate to spoilage of lamb and beef. She is interested in using new approaches like amplicon-based sequencing, metabolomics, and bioinformatics with traditional microbiology techniques to address her research challenges. To enrich her perspectives and learn new skills, Elerin also helps with teaching undergraduate students in microbiology units. Through this role, she supports improvement of the student learning experience while strengthening her own understanding of microbial physiology and ecology.