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BOOK OF ABSTRACTS

Biopurification of pulse protein concentrates by lactic acid bacteria.

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● The demand for plant-based, high-protein food products is on the rise. However, their acceptance is limited by the presence of anti-nutritional factors such as Raffinose Family Oligosaccharides (RFOs). Fermentation with lactic acid bacteria (LAB) can be employed as a biopurification method to degrade RFOs. However, the effects of fermentation on RFOs are rarely investigated together with other influencing factors, such as the type of pulse. In this study, we used a full-factorial design of experiments to evaluate the impact of three factors: i) pulse type, faba bean or yellow pea; ii) type of enrichment, starch-rich (SRF) or protein rich fractions (PRF) and iii) LAB species, *Lactiplantibacillus plantarum* WCFS1 (LpWCFS1) and *Leuconostoc mesenteroides* DSM20343 (Lm20343). Doughs were prepared from sterile flours and water and incubated with the bacteria for 48 h. Mono- and oligosaccharides, organic acids, pH and viable cell counts were measured before and after fermentation. While lactic acid concentrations were highest after fermentation of PRFs, sourdoughs made with SRFs had a lower pH, indicating a higher buffering capacity of the PRFs. Initially, RFOs were more abundant in the PRF of both pulses, while mono- and di-saccharides were present in similar concentrations. After fermentation, Lm20343 degraded RFOs to a greater extent, despite LpWCFS1 producing more lactic acid and reaching a higher cell concentration. A PERMANOVA model showed that the LAB species had the strongest effect on RFO degradation. These results show that LAB selection is key to optimise RFOs removal, outweighing the effects of pulse cultivar selection or fractionation strategy.

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