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Comprehensive Molecular Characterisation of Bioactive and Antinutritional Factors in Sustainable Proteins

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Abstract

The global food supply is facing a crisis with volatile geopolitical landscapes and production struggling to meet demand. Sustainable proteins, or alternative proteins, are rapidly emerging as revolutionary food sources that minimises environmental impact and yet fulfill nutritional demand. Molecular characterisation of sustainable proteins enables comprehensive nutrition profiling and safety assessment to enhance consumer acceptance and confidence. Here, we develop a multiomics-driven workflow for comprehensive molecular characterisation of bioactive and antinutrient proteins. Using different soy-based sustainable protein products as a model, we identified key protein classes including bioactive proteins/peptides, flavour peptides, allergens and antinutrients. This comprehensive workflow can be broadly applied for deep characterization of any sustainable protein at the molecular level and informing food processing strategies to enhance nutrition, flavour and safety profiles.

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