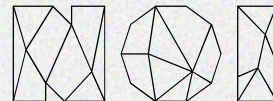


INTERNATIONAL
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TECHPARK SÜDTIROL / ALTO ADIGE

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BOOK OF
ABSTRACTS

Targeted fermentation of chickpea flour enhances nutritional value and gut health-promoting properties.

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● The increasing global demand for sustainable and functional protein sources has driven interest in legumes such as chickpeas (*Cicer arietinum* L.), which are rich in protein and bioactive compounds but limited by the presence of antinutritional factors, raffinose-family oligosaccharides (RFOs) and undesired aroma compounds. This study investigated the targeted fermentation of chickpea flour using microbial strains selected for their ability to reduce RFOs, aldehydes, and the growth of undesirable microorganisms and pathogens, while improving the overall sensory profile. *Lactiplantibacillus plantarum* LP23, alone or in combination with *Debaryomyces hansenii* Y15A, was applied to enhance the nutritional profile and assess its impact in an *in vitro* gut model. Samples were characterized for their peptide and amino acid content, digestible and damaged starch, antioxidant activity, and volatilome. Fermentation significantly increased soluble peptides and total amino acid (at least doubling their content), reduced damaged starch, enhanced antioxidant activity, and confirmed the reduction in total aldehydes. Moreover, fermented ingredients and their application in a fortified pasta formulation were tested, upon INFOGEST digestion, in a 24 h *in vitro* gut model. The results demonstrated a beneficial modulation of microbial composition and its metabolic activity, with increased production of short-chain fatty acid (SCFA), notably acetate and butyrate. These findings support the application of tailor-made fermentation to develop next-generation plant-based functional ingredients for gut health and sustainable nutrition.

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