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Non-Conventional plant-based ingredients in sourdough breads enhanced Nutritional value and impacted on gut microbiota**Federica Mastrodonato***Free University of Bozen-Bolzano, Italy*

Statement of the problem: Food digestibility and its impact on gut ecosystem are increasingly recognized as essential for promoting healthier lifestyles. The synergic combination of sourdough fermentation and the fortification with fermented plant-based substrates (including exploitable by-product) is a strategy with potential for enhancing the health benefits of leavened baked goods that was not explored so far. This study aims to address this gap by designing and characterizing new sourdough breads fortified with apple by-products (AB), avocado, and walnut, and investigating their impact on gut microbiota and its metabolic answer.

Methodology & theoretical orientation: Apple by-products, avocado, and walnut purees underwent fermentation with *Lactobacillus plantarum*, and non-conventional flours were obtained after freeze-drying of fermented matrices. Different percentages and combinations of such matrices were screened as new ingredients for making a baker's yeast wheat bread. A type II sourdough was also selected after a screening of different starters combinations. Two new sourdough breads were prepared combining sourdough fermentation and fortification with the selected combinations of non-conventional flours and characterized based on nutritional properties and digestibility. The impact of new fortified sourdough breads on the gut ecosystem was assessed *in vitro* using the SHIME® model.

Findings / Results: The fortified sourdough breads had improved protein digestibility and starch hydrolysis, and enhanced content of dietary fiber, phenolic and unsaturated fatty acids. The *in vitro* administration promoted the synthesis of short-chain fatty acids in gut ecosystem, and expanded genera associated with potential positive health effects.

Conclusion: The fortification of sourdough bread with fermented plant-based ingredients offers a promising approach for developing leavened baked goods with improved nutritional values and potential positive impact in gut ecosystem while also effectively utilizing food by-products.

Biography

Federica Mastrodonato is a third-year PhD student in Food Engineering and Biotechnology at the Faculty of Science and Technology, Free University of Bozen-Bolzano, Italy. Her research focuses on the digestibility of fermented food and formulation, specifically investigating the chemical and nutritional factors affecting digestibility and their impact on the human gut microbiome and metabolome. To replicate the functionality of the large intestine, she utilizes the Simulator of the Human Intestinal Microbial Ecosystem (SHIME®).