WORLDWIDE PERSPECTIVES ON GEOGRAPHICAL INDICATIONS

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INNOVATIONS AND TRADITIONS FOR SUSTAINABILITY

P.G.I Green Altamura Lentils: a sustainable innovation for bakery products

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There is a growing requirement for plant-based diets and more efficient methods of food processing to address these concerns (FAOSTAT, 2022; Monnet et al., 2019)

Within the leguminous plants, lentil is certainly one of the most interesting from a technological point of view.

Value-added processing of lentils (*Lens culinaris Medik.*) is of growing interest for the development of new food ingredients, owing to their nutritional composition and promising technological properties.

USE OF LENTILS IN THE BAKED GOODS INDUSTRY

- excellent nutritional composition and potential health-beneficial effects, e.g. reduce diet-related chronic diseases, increase satiety
- sustainable crop (atmospheric nitrogen fixers, reduces the use of fertilizers for cultivation and enhances soil quality, requires less water).

In the food industry, lentils from international sources (e.g. Canada) may be more commonly used for processed products due to cost-effectiveness and availability, but premium Italian lentils are still sought after for high-quality products.

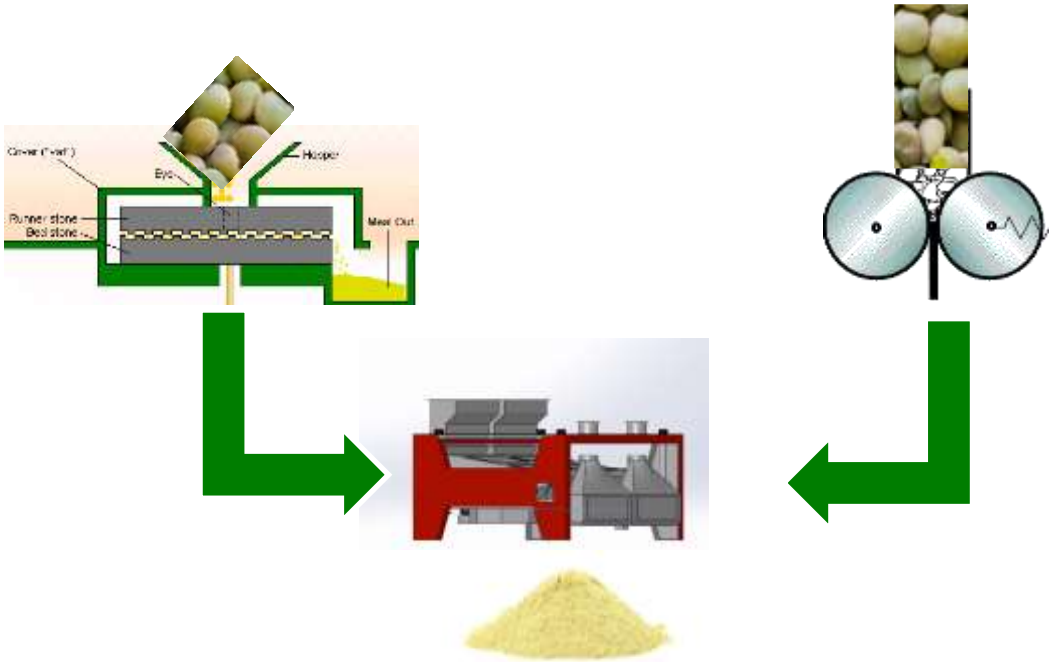
Lentil composition varies significantly with genetic and environmental factors, but overall, the crop contains a high number of nutritional components and is gluten free

Green Altamura Lentils (*Lens culinaris Medik.*) are produced in Altamura (Bari, Southern Italy) and are authorized by the Commission of the European Community to receive the Protected Geographical Indication (P.G.I.) (www.eur-lex.europa.eu /reg_impl/2017; European Union, 2017).

LENTICCHIA DI ALTAMURA IGP

Green Altamura Lentils can be a very promising alternative to soy and pea, because they are an affordable source of proteins (26 g / 100g), dietary fibres (8.4 g / 100g), carbohydrates (50g /100g), minerals, vitamins (mainly vitamin B3/niacin) and phenolic compounds (Gallo et al., 2021).

Lentils are usually used for consumption in the form of cooked whole seeds or split cotyledons or processed into various ingredients (e.g., flour) for the uses in different food applications.



The percentage of lentil flour used typically ranges between 10% to 30% of the total flour content in the recipe.

The successful use of lentil flour as bakery ingredient is strictly related to its such as nutritional (e.g. non-soy source, gluten free), physicochemical, functional (e.g., solubility, water and oil absorption capacities), aromatic or sensorial (e.g. mild taste) properties (Adedeji et al., 2014; Romano et al., 2025).

Lentil flour is regularly subjected to a one or more processing methods (*e.g.* germination or extrusion cooking) which impact on the composition and hence their properties, resulting in ingredients with *tailored* properties (Pasqualone et al., 2020; Romano et al., 2024).

THE POTENTIAL OF GERMINATION AND EXTRUSION- COOKING TO IMPROVE THE PROPERTIES OF P.G.I GREEN ALTAMURA LENTILS

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Effects of germination time on the structure, functionality, flavour attributes, and *in vitro* digestibility of green Altamura lentils (*Lens culinaris Medik.*) flour

Annalisa Romano, * Lucia De Luca and Raffaele Romano

European Food Research and Technology

ORIGINAL PAPER

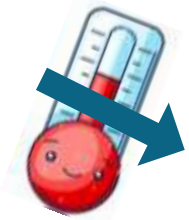
Exploring structure, volatile profile, physicochemical and functional properties of raw and extruded- cooked lentil flours for their use in bakery products

Annalisa Romano · Lucia De Luca · Raffaele Romano

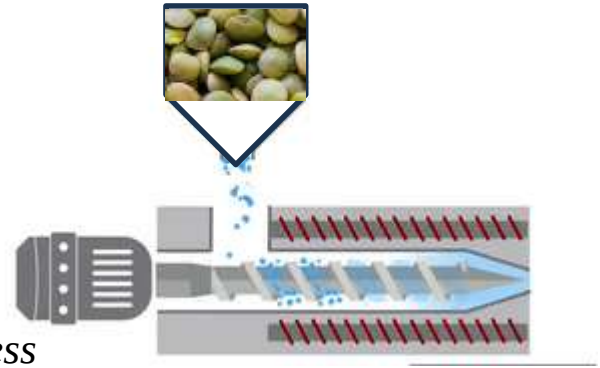
Annalisa Romano, University of Naples Federico II- Italy
Rome, Italy- 20 FEBRUARY 2025

onfoods

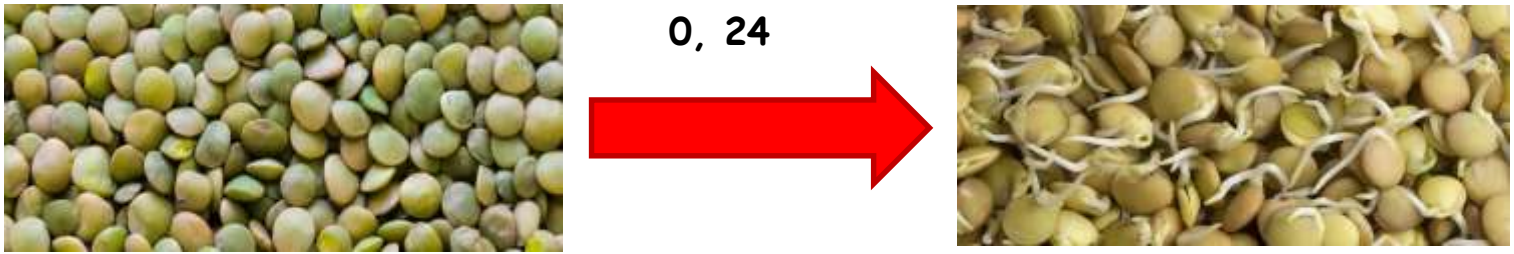
soaking tank



thermo -mechanical process



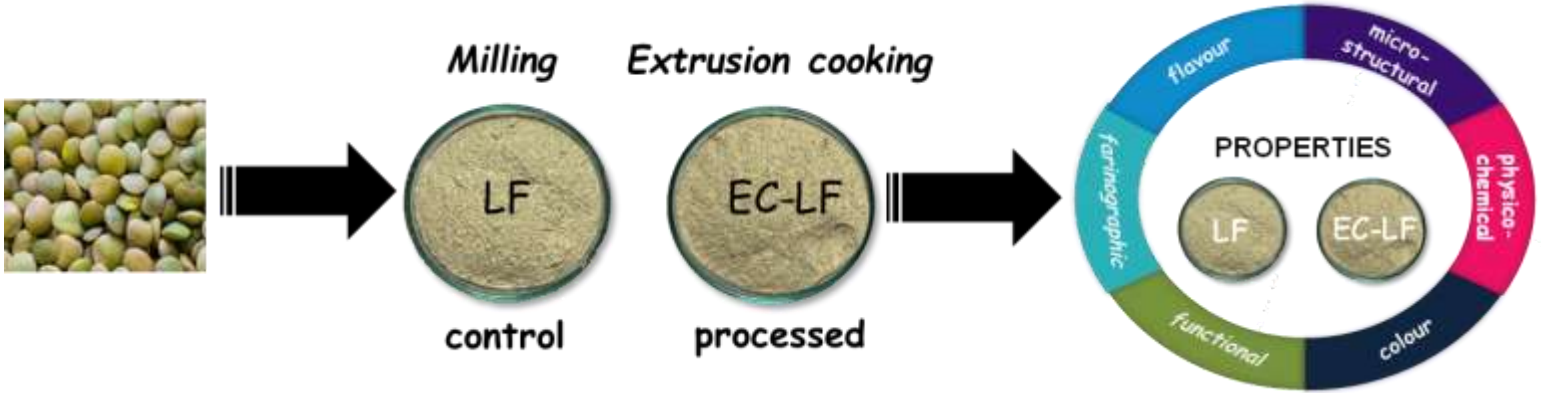
RESULTS:



- Germination of P.G.I Green Altamura Lentils can be a practical and effective treatment to improve their nutrional, functional and chemical properties

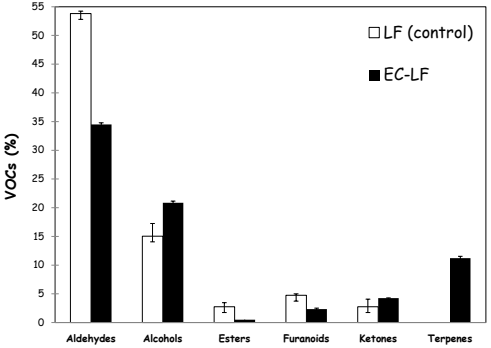
- Germinated samples performed better in terms of WHC, OHC, SI and ΔH than control (0h).
- Germination of lentils can be a practical and effective treatment to improve aromatic profile
- A decrease was observed in total starch content (TS), amylose and eGI values (44) of germinated P.G.I Green Altamura Lentils.

RESULTS:



- The modifications of P.G.I Green Altamura Lentils by EC can bring about processed flour with microstructure, proximate composition, functional and nutritional properties with the potential to be used in different food products.

- The farinograph mixing curve of EC -LF showed an increase in water absorption (68%), in dough development time and stabilization time, with lower weakening respect of LF (57%).



- EC -LF showed a lower content of volatile organic compounds that influences the undesirable beany flavour and a higher total polyphenols content (272.8 mgGAE/100g) compared to LF (190.8 mgGAE/100g).

Future Work & Research Directions:

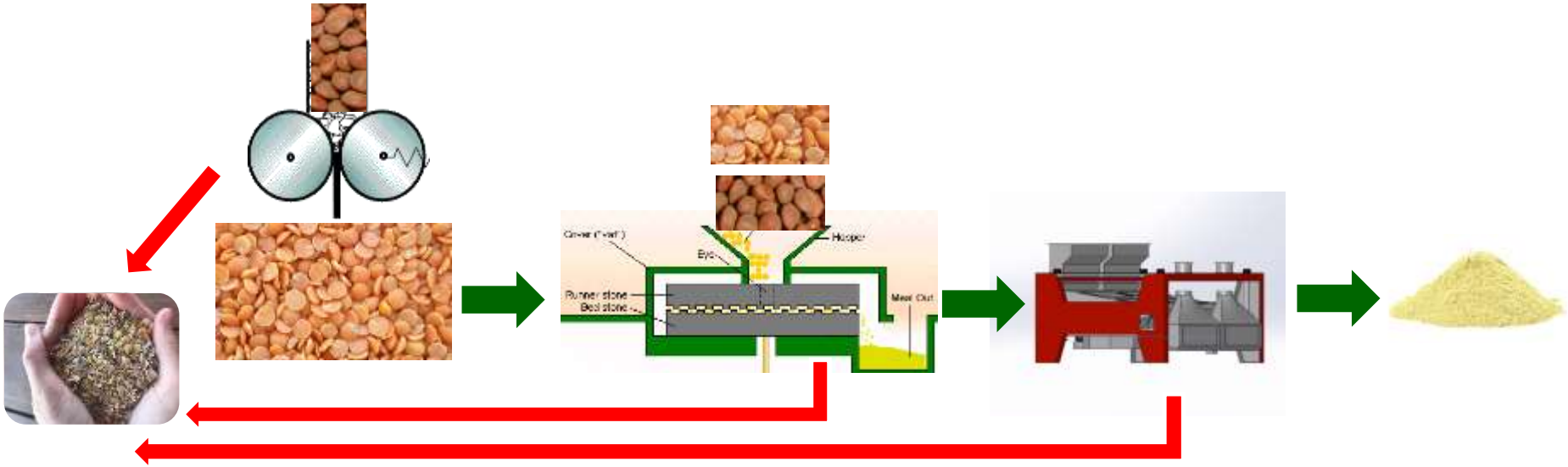
Enhancing Lentil-Based Food Formulations: Continue exploring new strategies to improve the quality, functionality, and sensory attributes of lentil-based products.

Deepening Understanding of P.G.I. Green Altamura Lentil Flour: Expand knowledge of its functional, nutritional, and technological properties, maximizing its potential in various food applications.

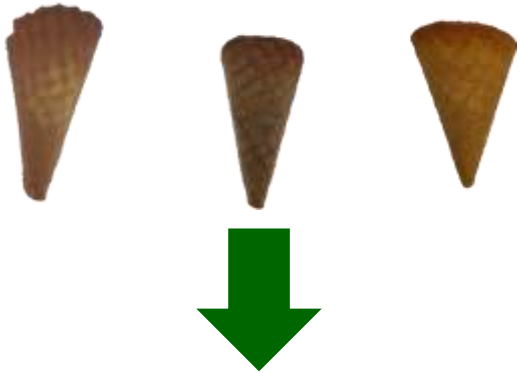
Sustainability & Market Integration: assess consumer acceptance to boost market adoption of PGI lentil-based food innovations.

To develop innovative bakery products that respects the circular economy perspective for a sustainable system.

A novel study Using Lentil Waste.



To develop a bakery product with specific health and functional attributes obtained through the use of innovative ingredients derived from waste by-products of food supply chains, such as lentil hulls



Lentil waste: a powerful novel ingredient.

Thank you for your attention!

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