Innovative biotechnological solutions for the production of new bakery functional foods

Result in Brief

Project information

BAKE4FUN

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Closed project

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Coordinated by:
ALMA MATER STUDIORUM - UNIVERSITA DI BOLOGNA

Better grains for healthier bread

Bread is a staple food source in many people's diets. Now, bakery products that use ancient grains and fortify them with iron have made it healthier.

Iron deficiency impacts over a billion people worldwide. Although iron-fortified flour exists on the market, iron-fortified foods are usually rejected by consumers due to unacceptable changes of their organoleptic characteristics.

The EU-funded project BAKE4FUN (Innovative biotechnological solutions for the production of new bakery functional foods) addressed this challenge. One of the project goals was to develop iron fortification of bakery products. The use of a new iron microencapsulation technology has increased iron stability and bioavailability, offering protection against challenges induced by temperature, acidity and oxidation.

BAKE4FUN used a spray-drying microencapsulation process. To avoid reactions with other food
components, wall integrity of microcapsules was tested at 180 °C and showed no damages. The microcapsules also resisted gastrointestinal challenges.

Based on performed bioavailability tests, three formulations of microencapsulated iron were selected to fortify bread for in vitro studies. The bread was prepared at pilot-plant scale. Researchers also conducted functional and organoleptic testing of bread fortified by microencapsulated iron.

Another BAKE4FUN accomplishment was to use einkorn, an ancient grain, in baking. Consumers have increased awareness of the health benefits of whole grains and so-called ancient grains. Adding non-conventional whole grain flours increases antioxidant intake and improves gut microflora. BAKE4FUN investigated einkorn Triticum monococcum ancient flour, since there is no scientific evidence about its nutritional or health impact.

In the first nine months, BAKE4FUN compared the functional components (polyphenol, carotenoid and antioxidants) in einkorn flours and wheat flours. Einkorn flours possessed the highest content of the bioactive compounds and antioxidant activity. The team produced einkorn flour bread prototypes for in vitro tests.

BAKE4FUN was coordinated in Italy with seven participants from three countries. The project has made possible the production of bakery foods with an improved nutritional profile and health promoting effects.

Keywords
Grains, bread, bakery products, iron, BAKE4FUN, functional foods

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