

## **In plant food design: new strategies for healthy food products development**

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Several recent scientific discoveries about the functioning of human gastrointestinal system suggested several possible targets for healthy foods design. Food products can be designed to trigger different biochemical pathways and physiological functions, but a proper understanding of the digestion mechanisms is needed to design appropriate food matrix to reach specific target and health target.

The traditional recommendation about increasing the consumption of fruit and vegetables was based on their high content of vitamins, phytochemicals and minerals, however their nutritional value cannot be only calculated as the sum of the micronutrient concentrations.

The characteristic of the food matrix is an essential factor determining the actual bioaccessibility of the various plant micronutrients and in turn the health relevance of the fruit and vegetable intake. To properly understand the actual nutritional relevance of the compounds present in a food product a detailed knowledge of the matrix behaviour during the digestion process should be achieved.

In vitro and animal studies highlighted the relevance of the food matrix to address the actual release of fruit and vegetable compounds along the gastrointestinal tract and therefore their bioaccessibility at gastric and small intestine level. Moreover, it is now well established the lack of bioaccessibility is not necessarily a negative aspect. Entrapping some compounds in a tight matrix and make them not bioaccessible can be considered a good way to deliver compounds to the gut microbiota.

In this lecture the concept of antioxidant dietary fibre will be illustrated providing some examples of the potential to use agronomical strategies to modulate bioaccessibility and delivery of micronutrients by design plant food microstructure.

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