

Development of functional foods based on intelligent choice of food ingredients and processing condition

Prof. Dr. Indrawati Oey
Department of Food Science
University of Otago
PO BOX 56, Campus Dunedin
Dunedin 9054 - New Zealand
Email: Indrawati.oey@otago.ac.nz

Abstract

Consumer awareness and choice of healthy foods is an important factor for food scientists and industries to determine how to strategically and effectively develop functional food products which can be transferred to industrial applications. Research on the development of functional foods based on commodities commonly bought by the consumers currently becomes important. Stability and functionality of health related compounds depends on various factors such as (i) the species and the amount of bioactive compounds, (ii) the linkage of the compounds and its synergistic/antagonistic interaction with other food compounds; (iii) food structure and matrix and (iv) the genetic, nutrition status and other host factor related to human. However, the choice of food ingredients and processing technologies for food design cannot be separated in the development of functional foods. Food processing and preservation is necessary to obtain stable and safe products. Therefore, different strategies how to develop functional foods using intelligent choice of food preparation/processing and food ingredients will be discussed in this presentation as a strategy to design and develop functional foods which are closed to the consumer's expectation and familiarity.

The bioaccessibility of membrane bound health related compounds can be significantly increased by modifying food matrix and structure during food preparation and processing. Higher bioaccessibility implies more nutrients available and accessible before absorption in the human body. At the same time, the stability and the profile of vitamin derivatives are also affected by food preparation and conventional food processing such as mixing, heating etc. Stability of bioactive compounds in fruit and vegetables is mostly affected by chemical and enzymatic reactions. Hereto, the kinetics and the mechanism of these reactions in food materials during food processing either using conventional or novel (such as high hydrostatic pressure) technologies should be well understood in order to enhance the production of healthy compounds while inactivating microorganisms related to food safety and maintaining overall desired food quality such as texture and flavour.

Case studies related to industrial application for example on polyphenols enriched cheese and commercial coffee preparation will also be discussed. In case of antioxidant rich cheese, ripening affected the amount of total phenols. Changes in the amount of polyphenols extracted and the antioxidant profile were observed for different commercial coffee preparations. This study showed that different serving sizes used by coffee retailers also gave significant effects on the amount of total phenols consumed.