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Functional foods: phytochemicals, polysaccharides and proteins. How food formulation affects food structure and function

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Background – Functional foods represent a global market for potential product developers within the food industry. Markets exist for foods rich in phytochemicals, fibres, proteins and oils. The value of these fabricated foods offers incentives to companies to develop products for the consumer.
Objective – To elucidate the accuracy of claims behind more recent functional food ingredients and explore how NZ native plant components can be utilised as potential functional food ingredients for the future.
Design – A literature study was conducted of current academic research into the separation, identification and utilisation of plant based products. In particular, attention focussed on the role of plant proteins and polysaccharides in the manipulation of food structure and how this affects the nutritional quality of foods.
Outcomes – Case studies were described from a New Zealand and Australian perspective to illustrate how the identification of ingredients, determination of functionality and development of model food systems can benefit food companies entering into export markets throughout the world. Evaluation of the effectiveness vs the marketing perspective of functional food ingredients was made.
Conclusion – Careful discernment of health claims attributed to functional food ingredients need to be made in order to determine the true benefits of these ingredients in terms of human nutrition.

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Identification and characterization of the major allergens in six crustacean species commonly consumed in Australia

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Background – Worldwide fish and shellfish play an important role in human nutrition and are important sources for high quality proteins and fatty acids. The strong move to healthier eating habits has resulted in even greater demands *for seafood. Increased levels of consumption and production of seafood have resulted in increasing reports of health* issues among consumer but also among workers in the production and retail industry. Crustaceans constitute a major part of the different seafood species consumed in Australia; however, there is little information available on the major allergens which are fundamental for the correct diagnosis and management of this life threatening disease.
Objective – To identify and characterize major allergens present in six commonly consumed crustacean species.
Design – Raw and cooked protein extracts were prepared from crustaceans including prawn, crabs and slipper lobster. The major allergen, tropomyosin was isolated from prawns by Anion-exchange chromatography. The proteins of raw and cooked prawn and purified tropomyosins were separated by SDS-gel electrophoresis and IgE binding patterns compared by immunoblotting using sera from allergic patients. A commercial anti-tropomyosin antibody was used to confirm the presence of tropomyosin. Subsequently the amount of tropomyosin in the different protein preparations was quantified using a specific ELISA to Australian shrimp.
Outcomes – The isolated major crustacean allergens in all investigated crustacean species had a molecular weight of approximately 35-38 kDa. These allergens were confirmed to be tropomyosin and appeared to have several isoforms as well as polymers as indicated by IgE binding. Novel yet unidentified allergens of approximately 60 kDa were identified in crabs and lobster which different from prawns.
Conclusion – It was confirmed that the main heat-stable allergen in most Australian crustaceans is tropomyosin. In addition novel allergens were identified in Australian crab and lobster species which might be clinical important.