

PRO1527 Development of innovative, high-value, pulse-based food products with enhanced functional and nutraceutical properties for potential utilization

The study aims to develop innovative nutrient enriched pulse-based convenience and functional foods to promote good health and optimum nutrition among the India population. The pulses selected for the study were the commonly consumed pulses in Tamil Nadu namely chickpea, pigeon pea, peas, and green gram in addition to the pulses lentil and faba bean. Although lentil is commonly consumed in Tamil Nadu as part of the pulses procured and sold at subsidized rates through the Public Distribution System, faba bean as a pulse is a new to the market. The physico-chemical characteristics of the selected pulses have been analysed. The six selected pulses were subjected to different processing treatments (20 treatments) to study the effect of processing on the levels of phytates, tannin, trypsin inhibitor activity, fructo-oligosaccharides, and antioxidant activity. Generally, the pulse-based functional foods available in the market are minimum, with majority of the pulse-based foods being fermented foods with high glycemic index or high calorie foods. Hence, experimental trials were taken to develop pulse-based protein enriched functional foods by wholly or partially supplementing with the respective selected pulse in the product formulation. The pulse-based functional foods which were standardized included pulse-based traditional foods like dhokla, khandvi, and pesaratu, high protein lentil-based snack food, probiotic pulse-based yogurt, and tofu-like product from faba bean. The product ingredients have been optimized for gluten-free foods viz., gluten-free noodles, bread and cake which have been standardized by Response Surface Methodology based on product physical and nutritional characteristics, and overall acceptability scores. The shelf life of probiotic yogurt was studied and has been found to maintain quality characteristics up to 15 days of storage at refrigeration condition. The pulse-based foods developed in the study have been found to be enriched in terms of protein content and other micronutrients compared to the respective control products. The quality characteristics of the developed pulse-based foods was evaluated. The ready to use (RTU) convenience mixes have been developed for dhokla RTU mix, pesarattu RTU mix, and gluten-free cake mix. The quality characteristics have been analysed and the shelf life study of the products has been initiated. The glycemic index and glycemic load of the gluten-free bread developed from lentil was estimated in ten healthy volunteers. The glycemic index and load were 54.3 and 21.8 respectively, thus indicating that the lentil based bread falls under the category of low glycemic index foods. Also, a tofu like product from faba bean residue after extraction of the faba bean milk extract was standardized which had good product acceptability and high protein content. The ready to eat lentil-based snack dhal prepared from blanched and dried lentil had a crispy, porous, and easily chewable texture, which would confer it an ideal high protein snack food for both the elderly population, young children, and other vulnerable groups. Also, the same dhal was found to be comparatively quick cooking and can be used in preparations to add protein value like in soups, porridges, etc., at less cooking time. Noodles are popular among children and also among all age groups, use of lentils in the noodle formulations can be gluten-free and at the same time provide for higher protein content which will serve to meet protein needs of the population. Hence, the development of innovative pulse-based functional foods and popularisation of the same among the stakeholders will lead to increased availability of pulse-based foods in the market. This is expected to increase pulse consumption and enrich the protein content of the daily diet in terms of quantity and quality leading to better nutrition and health.