Functional roles of dietary fibres from selected agricultural by-products in lowering glycemic index values of foods

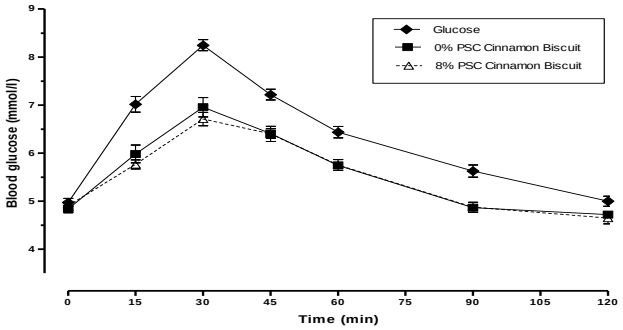
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Abstract (300 word limit)

Statement of the Problem: Presently, the prevalence of non-communicable diseases is increasingly growing with the number of diabetic people expected to increase from 171 million in 2000 to 366 million in 2030. This is the main cause of morbidity and mortality all over the world because it can lead to problems in health and affect the quality of life. High intake of refined carbohydrates coupled with low intake of dietary fibres (DF), particularly from fruit and vegetables, has increased the risk of CVD, diabetes and other illnesses. The purpose of this study is to develop and investigate the effects of incorporation of selected agricultural by-products in enhancing DFs content and lowering glycemic index (GI) value in foods. Methodology: the GI was determined according to WHO/FAO 1998's protocols. Findings: A low GI diet is beneficial to reduce the risks and complications of different health conditions such as diabetes. Mechanistically, the DF enhances glycemic response by raising the rate of absorption of glucose in the small intestine, thereby lowering the GI value. Our research reveals that incorporation of materials from banana (over-ripe banana), oyster mushroom and cornlettes in a few baked-based products such as cookies, pasta, cakes, muffins and flatbread is proven in improving DF content while lowering the GI values. A low GI diet will make us feel full for a longer duration while minimizing overeating at the same time. Besides, the SEM observation reveals that the damaged cornlettes starch reduces starch hydrolysis, thus slowly raises blood glucose. Also, the ethyl acetate fraction of cornlettes was possessed higher antioxidant and scavenging capacities followed by other fractions in the antioxidant assay tested. Conclusion & Significance: Being physically active and eating a sufficient amount of DF from fruits and vegetables are vital in maintaining the health status and sustaining quality of life and societal well-being.

Image

Table 1: Mean incremental area under curve (iAUC) and GI value of cookies incorporated with oyster mushroom



Recent Publications (minimum 5)

1. Hamzah N, Safuan S, Wan Rosli WI (2021) Potential effect of polyphenolic-rich fractions of cornsilk on protecting endothelial cells against high glucose damage using *in vitro* and *in vivo* approaches. Molecules 26:3665-2675.
2. Wan Rosli WI, Wan Amir Nizam WA, Nordiana AB (2021). Does oyster mushroom (*Pleurotus sajorcaju*) powder addition improves nutrient composition, sensory acceptability and glycemic index (GI) of Flatbread (Tortilla)? Kuwait Journal of Science 48(2):1-12.
3. Tai YY, Tengku Ismail TA, Wan Rosli WI (2021). Morphological characterisation and glycaemic responses of cake developed from carrot and concentrated *Nypa fruticans* sap. Food Research 5(3):321-326.
4. Ng YV, Tg Alina TI, Wan Rosli WI (2020). Effect of overripe banana in developing high dietary fibre and low glycemic index cookie. British Food Journal 122(10):3165-3177.
5. Helmyati S, Kiasaty S, Amalia AW, Sholihah H, Kurnia M, Rohana AJ, Wan Rosli WI, Hamid NA, Malik V, Hu F (2020). Substituting white rice with brown and black rice as an alternative to prevent diabetes mellitus type 2: a case-study among young adults in Yogyakarta, Indonesia. J Diabetes Metab Disorder 19(2):749-757.

Photograph



Biography (150 word limit)

Prof Dr Wan Rosli has his expertise in the development of functional foods which are containing dietary fibres and low glycemic index (GI) products for health-conscious consumers and diabetes individuals. The main strategy is focused on the concept of 'Total Food', which uses all parts of edible items of natural products including fungi and vegetables. We also investigate the ability of oyster mushroom as a functional food ingredient; cucurbit fruits as an anti-hyperglycemic and prebiotic agent; brown-rice and brown-rice based products as an alternative staple food to reduce obesity and diabetes. With regards to the publication, we have published more than 110 journals in various indexed journals. We are welcoming any parties to collaborate with us for joint research and development activities in the field of food science, diet and nutrition.

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Notes/Comments: