

Research

Native and Modified Sago (*Metroxylon sago*) Starches as an Ingredient in The Formulation of Low Glycaemic Food Product

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ABSTRACT

Native sago starch has a high content of resistant starch (RS) which is associated with low glycaemic and beneficial to individuals with obesity and diabetes. Additionally, the RS is linked to the prebiotic properties exhibited by starch. This study aimed to evaluate the predicted glycaemic index (pGI) and probiotic growth rates of food formulated with native or modified starches in the formulation of a breakfast drink. The sago starch was modified *via* microwave heat treatment (MHT) with different treatment duration or *via* pre-treatment followed by MHT. The formulation of food was performed by replacing a portion of wheat starch at percentages of 25, 50, or 75%. The pGI was determined by measuring the amount of glucose produced during *in vitro* digestion. Meanwhile, the probiotic growth rates were conducted by monitoring the optical density of *Lactobacillus casei* and *Bifidobacterium lactis* for 24 hr. Comparatively, food formulated with 50 and 75% starch showed lower pGI than other formulations. This was correlated with the increase of RS in food products. Meanwhile, the probiotic growth rates increase for a few of the formulations mostly with a higher pGI or low RS content which is contributed by the accessibility for fermentation to occur. In conclusion, the findings suggest the substitution of 50% wheat flour with native or modified sago starches is sufficient to increase RS content and lower the pGI of formulated food. In the future, investigation of RS components contributing to probiotic growth is needed to enable the exploration of new prebiotics with low glycaemic.

Key words: Functional food, glycaemic index, prebiotic, probiotic, retrograded starch

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INTRODUCTION

The interest in functional food has increased among consumers focusing on improving or maintaining their health. Hence, this increases the studies on various food components which include carbohydrates and proteins. Starch is one of the most studied food ingredients as it can provide a low glycaemic index value for food. This is contributed by the presence of resistant starch components in the starch itself (Zailani *et al.*, 2023). Food that contains low glycaemic index components is beneficial for diabetes patients and individuals with obesity (Bello-Pérez *et al.*, 2021). Many studies have focused on increasing the resistant starch content in starch *via* various treatments such as chemical, enzymatic, and physical treatments (Zailani *et al.*, 2023). Examples of modified starches displaying low glycaemic index were banana, maize, and cassava starches (Bello-Pérez *et al.*, 2021; Eyinla, *et al.*, 2021; Paramasivam *et al.*, 2021).

As starch has been used in the formulation of food products, for example in fish crackers and tempura mix, the supplement of resistant starch can create an opportunity to enhance the functional food properties between different food products. Examples of foods that are studied by adding