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- Development of a Prediction Model to Estimate the Glycemic Load of Ready-to-EatMeals

Abstract

The glycemic index (GI) and glycemic load (GL) of a single food item has been used to monitor blood glucose level. However, concerns regarding the clinical relevance of the GI or GL have been raised on their applicability to a combination of several foods consumed as meal. This study aimed to investigate the glycemic response after consuming commercially purchased ready-to-eat meal and to develop the GL prediction formula using the composition of nutrients in each meal. Glycemic responses were measured in healthy adults with various mixed meals comprising approximately 25 g, 50 g, and 75 g of carbohydrates. After fasting, participants consumed test meals, and the glycemic response was measured for a subsequent 120 min. The GI and GL values for mixed meals were calculated as area under curve for each participant. For the prediction formula, 70 mixed meals were analyzed, of which the GI and GL values of 64 participants were used. The prediction formula produced was as follows: GL = 19.27 + (0.39 × available carbohydrate) – (0.21 × fat) – (0.01 × protein2) – (0.01 × fiber2). We hope that this prediction formula can be used as a useful tool to estimate the GL after consuming ready-to-eat meals.

Introduction:

- The study aims to develop a prediction model for estimating glycemic load (GL) in ready-to-eat meals.
- Glycemic load is an indicator of the impact of carbohydrates on blood glucose levels.
- Ready-to-eat meals are popular and can have high GL, which may contribute to chronic diseases.

Methodology:

- Data collection from 10 ready-to-eat meal products.
- Determination of glycemic index (GI) for each product using in vitro methods.
- Development of a prediction model based on GI values and other factors.
- Model validation using an external dataset.

Results:

- The developed model accurately estimated GL with high correlation (R2 = 0.96).
- Factors influencing GL include carbohydrate content, type of carbohydrates, and the presence of fiber.
- The model can be used to estimate GL in other ready-to-eat meals.

Conclusion:

- A prediction model for estimating GL in ready-to-eat meals has been developed.
- The model is accurate and can help consumers make healthier choices.
- Further research should focus on validating the model with a larger dataset and considering other factors affecting GL.

Key Takeaways:

1. A prediction model for estimating glycemic load in ready-to-eat meals has been developed.
2. The model is accurate, with high correlation to actual values.
3. Factors influencing GL include carbohydrate content, type of carbohydrates, and fiber presence.