

Glycaemic Index Speed Test (GIST) For Food Products

Technology Overview

Our technology in the form of a Glycaemic Index Speed Test (GIST) is a rapid *in vitro* method to determine the glycaemic index (GI) in food products. This technology is a laboratory-based methodology/workflow that combines sample processing, enzymatic digestion and endpoint data analysis.

The GI is a way of measuring how fast carbohydrates are absorbed into the body and how that affects blood glucose levels. Low GI food is perceived as a healthier option than high GI food, as the rates of carbohydrates released and subsequent bodily absorption are slower. The Health Promotion Board in Singapore (HPB) has been actively engaging the public with its “Healthier Choice Symbol” (HCS) programme to encourage adoption of healthier diet options.

The current “gold standard” of measuring GI involves measurement of blood glucose in human volunteers and such *in vivo* methods suffer from variability issues in its GI measurements, along with significant lead time and costs.

Our technology provides a solution for faster, cost-effective, and versatile GI screening of food, encouraging the food manufacturing industry to adopt GI measurements as part of their product development and GI labelling on product packaging, thus benefiting the public.



Key Benefits

- High accuracy of GI values comparable to those obtained from *in vivo* methods
- Rapid GI measurement for short turnaround within a week
- Cost effective
- Versatile method for many forms of food
- Useful method for screening

Commercialisation / R&D Opportunities

- ✓ Available for further R&D collaboration
- ✓ Available for licensing
- ✓ Accepting business plans from interested parties

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Technology Features & Specifications

The technology provides a laboratory-based integrated method for GI measurement that combines sample processing, enzymatic digestion and endpoint data analysis. The technology mimics the conditions of food digestion in the human gastrointestinal tract and adapts these conditions into an *in vitro*, laboratory-based digestion of food samples for GI measurement. The technology possesses the following features:

- High accuracy: GI values of food samples tested using our method are comparable to *in vivo* GI values. The coefficient of variation from use of a glucometer to measure blood glucose is below 5%.
- Rapid: GI measurements obtainable with a high turnaround rate of less than a week.
- Cost effective: Cost of GI measurement per food sample at about 5 times lower than the *in vivo* method.
- Versatile: Our method can be used on solid, semi-solid or liquid food samples, on single or multi-food component, and over 16 categories of F&B products (baked goods, beverages, convenience meals, cookies, dairy products, fruits, legumes, noodles, condiments, snacks, sugars, vegetables, etc).

This technology aligns with the current trend of lowering GI in the food and beverage industry. It provides a rapid alternative to *in vivo* methods for GI screening and classification of food products, assisting food manufacturers in optimising product formulations towards lower GI status.

Market Trends & Opportunities

Diabetes is a chronic condition that affects more than 400 million adults globally, and this number is expected to increase to above 640 million, which equates to one in ten adults, by 2040. In Singapore, over 400,000 Singaporeans live with the disease. The lifetime risk of developing diabetes is one in three among Singaporeans, and the number of those with diabetes in Singapore is projected to surpass one million by 2050.

Since April 2016, the Ministry of Health in Singapore (MOH) has begun combating diabetes and diet management is a step in this initiative. Currently, most food products do not provide GI ratings, which limits information to interested consumers. The current “gold standard” of measuring GI uses *in vivo* methods, which have multiple problems of variability, long lead time and high costs due to use of healthy human volunteers as subjects. The long lead time and high costs may deter local companies from including GI labelling on product packaging.



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