

RESEARCH NOTE

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# Blood glucose response to a calamansi drink in healthy adults: a non-randomised study

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## Abstract

**Objective:** Glycaemic Index (GI) ranks the body's response to carbohydrate content in food such that high GI food increases postprandial blood glucose levels. One of the popular drinks at food and beverage outlets is a drink made from calamansi, a citrus that is believed not to induce an increase in blood glucose levels. In this non-randomised single-blind (participants) study, capillary blood from 10 healthy males were sampled following consumption of either glucose or the calamansi drink. The blood glucose measurements were then used to calculate the GI for the drink.

**Results:** The GI of the calamansi drink tested was calculated as 37, a value within the range of low GI foods.

*Trial registration* Clinical Trials identifier NCT04462016; Retrospectively registered on July 1, 2020.

**Keywords:** Calamansi, Glycaemic index, Post-prandial blood glucose

## Introduction

*Diabetes mellitus* is becoming a major public health concern worldwide [1]. Prolonged hyperglycaemia increases the risk of microvascular damage such as neuropathy that contributes to increased macrovascular complications such as ischaemic heart disease and ultimately reduced life expectancy [2]. As diabetics have increased hunger and food intake partly due to accelerated gastric emptying caused by absent or delayed secretion of insulin [3], normalising blood glucose slows its progression and prevents the development of complications [4]. Low glycaemic index (GI) food with a GI of 55 or lower, are slowly absorbed and produces lower peaks in blood glucose, which is useful for maintaining glycaemic control [5]. Decreased rate of glucose absorption reduces post-prandial rise in gut hormones such as incretins and insulin by maintaining suppression on free fatty acids (FFA) and counter regulatory responses, while at the same time achieving lower blood glucose concentrations. Over time, glucose is withdrawn from the circulation at a faster rate

such that its levels return to baseline despite continued absorption from the gut [6].

Calamansi, which is also known as “calamondin” in America or “limau kasturi” in Malaysia [7], is consumed by many due to its potential health benefits [8] that includes the potential to lower post-prandial blood glucose [9]. Blood glucose response following consumption of a commercially sold calamansi drink was evaluated in this study. Data from this study will be helpful to consumers making drink choices in view of the increasing number diabetic individuals in the community [10]. Data from this study will also provide baseline information for further community-based investigations related to the GI of other foods.

## Main text

### Materials and methods

This non-randomised, single-blind (participants) study that was based on the report of a joint consultation between the Food and Agriculture Organization (FAO) and World Health Organisation (WHO) [11] was conducted between January and May of 2018 at the teaching laboratory of the Faculty of Medicine and Health Sciences, Universiti Malaysia Sarawak. Consenting

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