

# Recipe Development and Sensory Analysis of Low Sugar Lemon Custard Cake by Using Sugar Substitutes for Diabetes Mellitus

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## Background

Over 700,000 people suffer from diabetes (Hospital Authority, 2023). Diabetes patients need to monitor their **blood sugar levels** through a balanced intake of carbohydrates, sugar, and fat (Hospital Authority, 2023). Some restaurants provide customized menus (gluten-free and vegetarian menus). However, **the restaurant seldom provides a low sugar menu for diabetics**, meaning it is difficult for diabetes patients to control their diabetic diet.

## Research Objectives

1. To conduct recipe testing using **rare sugar (RS)** and **monk fruit sweetener (MFS)** to replace **white sugar (WS)** in lemon custard cake (LCC) making.
2. To conduct **blind testing** and **sensory analysis** on the three types of LCC with RS, MFS, and WS, respectively.
3. To provide **insight for practitioners** in developing dessert recipes for diabetic patients.
4. To explore the **customer perception of a diabetic menu** in the F&B industry.

## Methodology

### 1. Quantitative analysis

- o Sensory evaluation on 3 types of LCC samples.
- o 53 participants' opinions on a diabetic meal in the HK F&B industry was collected.
- o Data is analyzed by the following methods

Descriptive analysis	Frequency analysis
Cross-Tabulation Test	Independent Sample T-test
Correlation analysis	Regression analysis

### 2. Qualitative analysis

#### Fixed Ingredients



#### Variable Ingredients

Sugar Substitutes	Normal Sugar
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MFS	RS	WS
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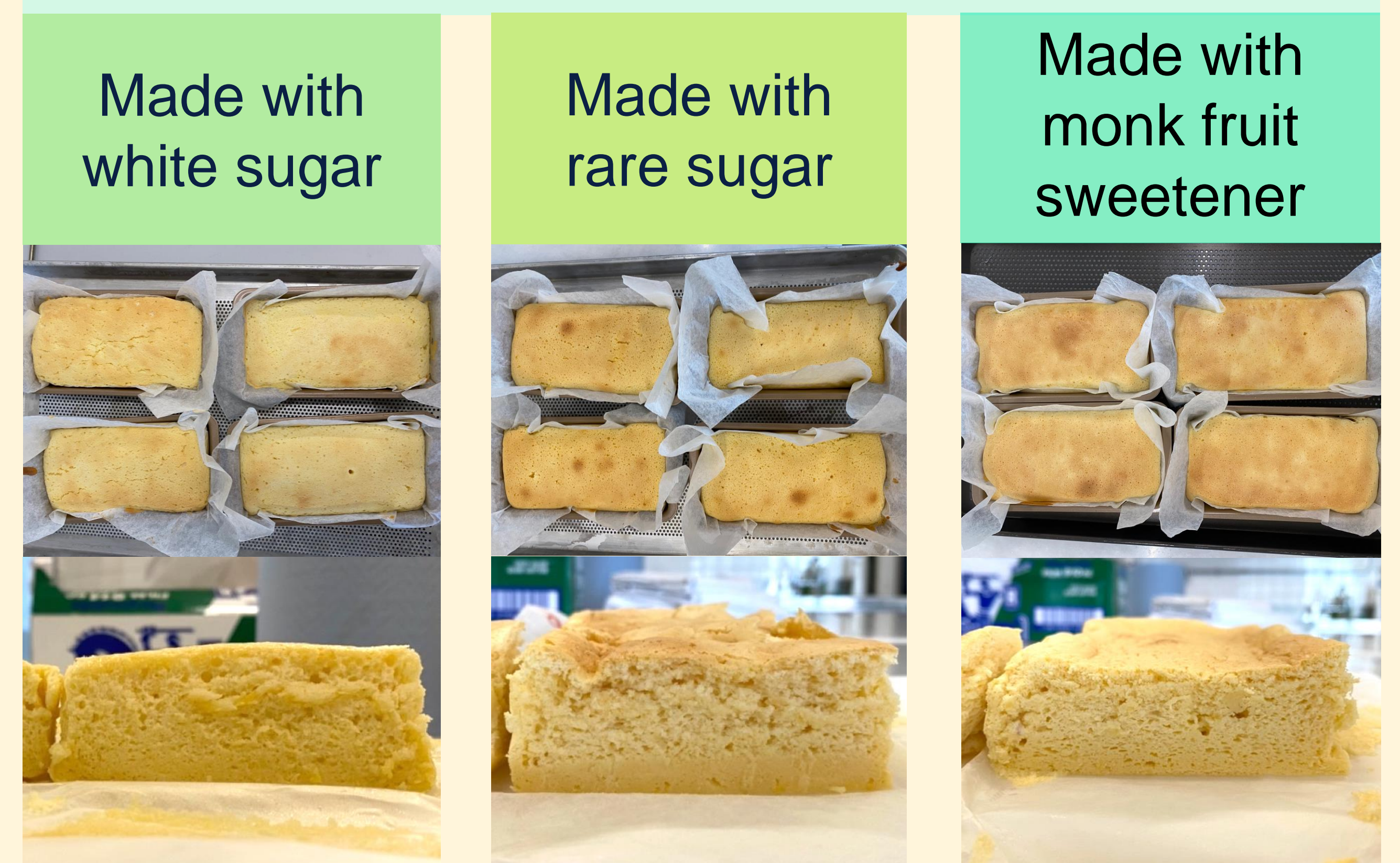
### Recipe testing

1. Constant baking time & temperature
2. Same recipe & equipment (Different sugar)

## Sensory evaluation

Appearance	Colour	Texture
Odors	Flavour	Sweetness

### Lemon Custard Cake



## Findings

1. The overall acceptability:  
LCC (MFS) > LCC (WS) > LCC (RS)
2. Using MFS to make lemon flavor desserts.

LCC made with MFS	LCC made with RS
Lemon and fruity flavour	Bitter flavour
MFS ↑ freshness of the cake	Dry texture

3. It is crucial to promote the diabetic diet, as it is low in calories and sugar.

## Conclusion

An alternative choice to replace WS in LCC, MFS is highly recommended, considering the pleasant taste and health concern.

- ✓ The overall acceptable:  
LCC (MFS) > LCC (WS) > LCC (RS)
- ✓ The flavour of LCC:  
LCC (MFS) > LCC (WS) > LCC (RS)

