

Dark Chocolate Enriched with γ -aminobutyric Acid (GABA) & Inulin as Prebiotic



BACKGROUND

GABA DACHO is a dark chocolate containing γ -aminobutyric acid (GABA) with anti-hypertensive potential and inulin with hypertensive preventive and prebiotics effects. Cocoa beans which are essential ingredient for chocolate production are rich in GABA naturally. However, the production of chocolate always leads to the loss of GABA. Therefore, pure GABA powder and inulin were used to produce a value-added GABA enriched prebiotic dark chocolate with higher GABA content and ACE inhibitory activity as compared to the commercial dark chocolate.

DARK CHOCOLATE ENRICHED WITH GAMMA-AMINOBUTYRIC ACID AND INULIN/
COKLAT HITAM DIPERKAYA ASID GAMA-AMINOBUTIRIK DAN INULIN

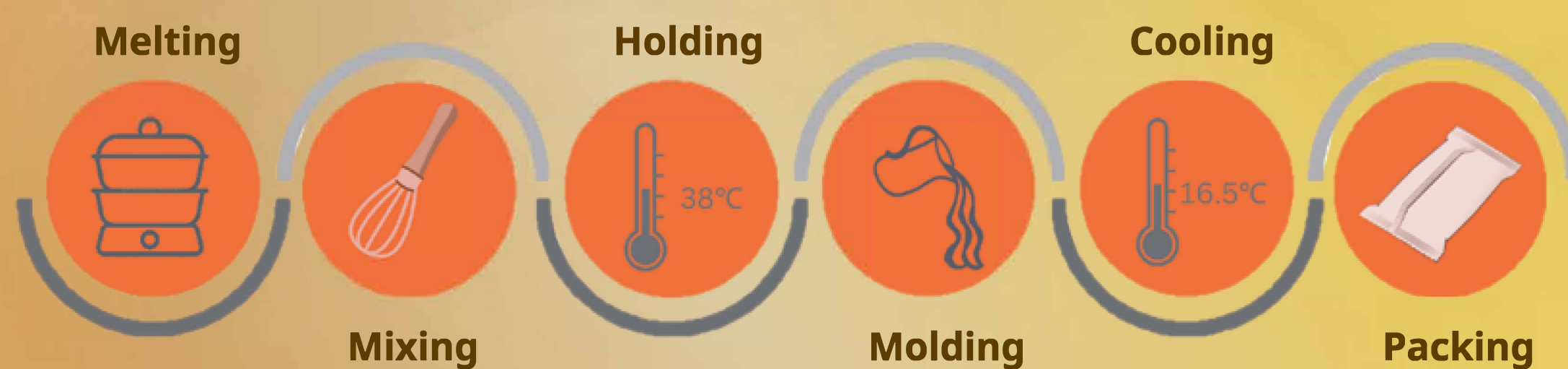
Nutrition information / Maklumat pemakanan		
Serving size / Saiz hidangan: 25 g (4 pieces)		
Average composition / Purata komposisi		
	Per 100 g / Setiap 100 g	Per serving / Setiap hidangan
Energy / Tenaga (kcal)	430.5	107.6
Energy / Tenaga (kJ)	1801.2	450.3
Protein / Protein (g)	6.4	1.6
Total fat / Jumlah lemak (g)	30.7	7.7
Carbohydrate / Karbohidrat (g)	32.1	8.0
Dietary fibre (g)	21.0	5.3

Ingredients: Cocoa powder, cocoa butter, icing sugar, water, inulin, emulsifier (soy lecithin), gamma-aminobutyric acid
Ramuan: Massa koko, mentaga koko, gula aising, air, inulin, pengemulsi (lesitin soya), asid gama-aminobutirik

Allergen information: Contains soya
Maklumat alergen: Mengandungi soya

Manufactured by:
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METHOD OF PREPARATION



ORIGINALITY OF THE INNOVATION

Koh, W. Y., Lim, X. X., Teoh, E. S. W., Kobun, R., Rasti, B. (2023). The Effects of Gamma-Aminobutyric Acid (GABA) Enrichment on Nutritional, Physical, Shelf-Life, and Sensorial Properties of Dark Chocolate. *Foods*, 12(1), 213. Doi: 10.3390/foods12010213.

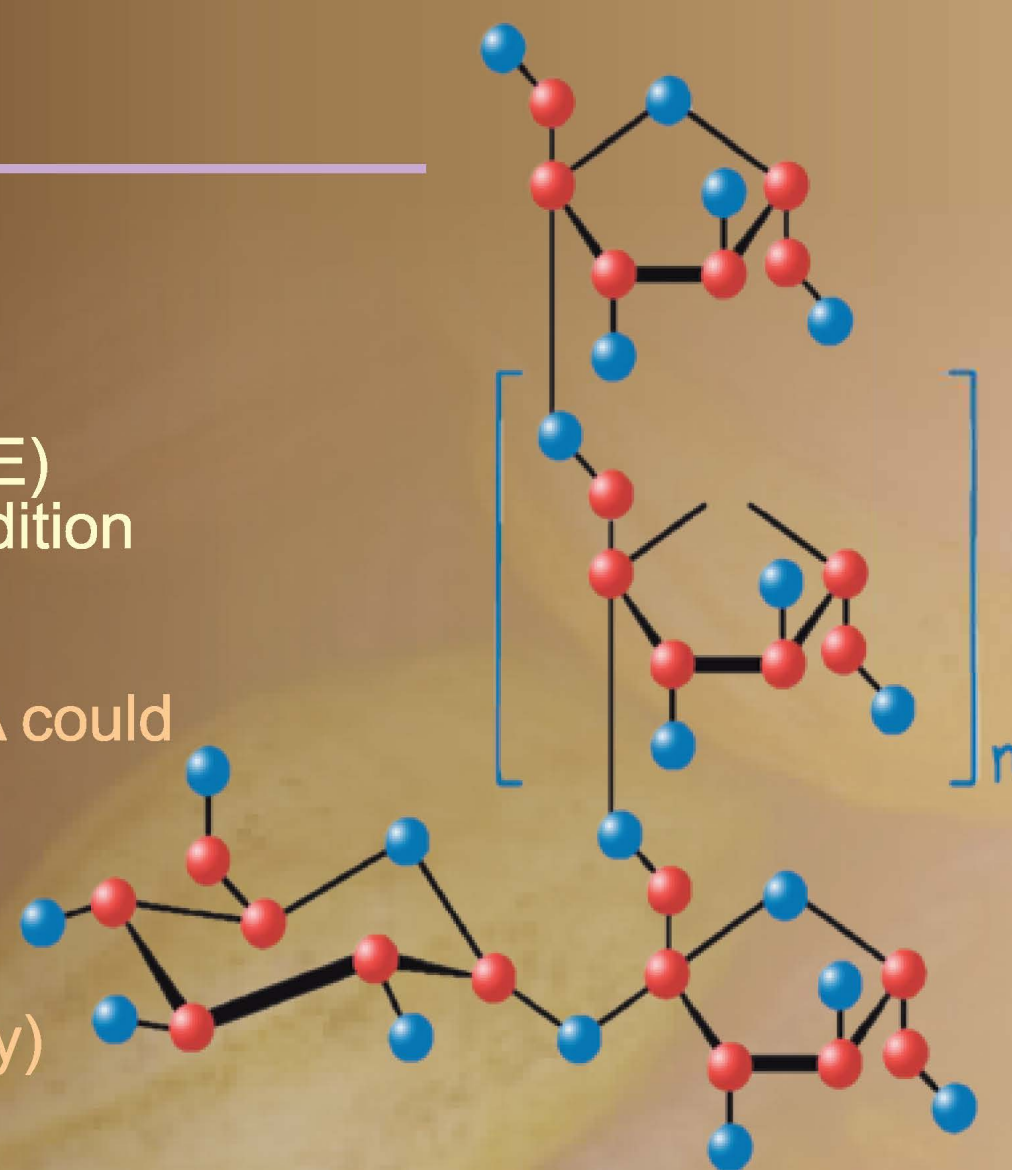


NOVELTY & INVENTIVENESS

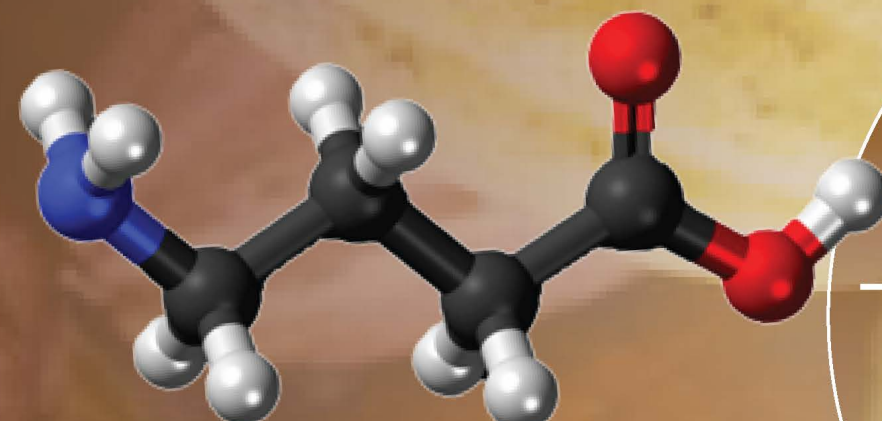
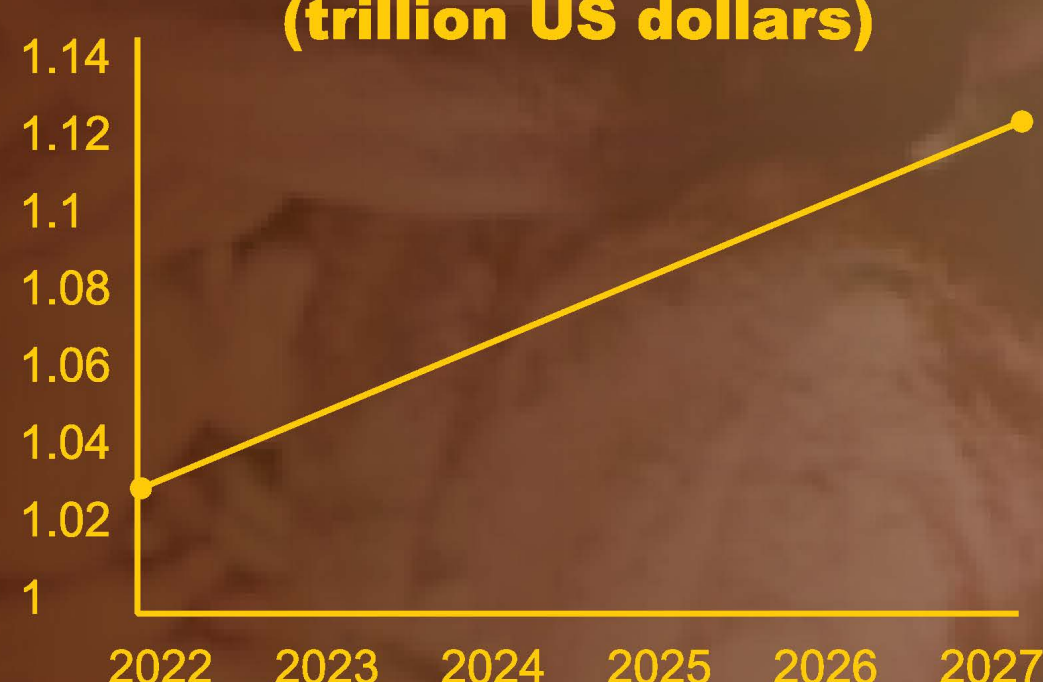
- Value added dark chocolate product: **126.31 mg GABA/per serving***
2g inulin/per serving*
- Anti-hypertensive effect: **95.01 % ACE inhibitory effect**
- Low in calorie content: **107.63 kcal/per serving***
- Non-dairy**
- Convenient: **Lightweight and small size**
*per serving: 25g of chocolate

GABA DACHO is believed to have great marketability potential due to the facts that:

- GABA display angiotensin-converting-enzyme (ACE) inhibitory function that regulating hypertensive condition by lowering the systolic blood pressure
- Studies have shown that orally administered GABA could
 - Decrease the blood pressure (10–20 mg/day) (Galli et al., 2022; Sahab et al., 2020; Pandey et al., 2021)
 - Improve somniphathy and depression (26.4 mg/day) (Pu et al., 2019)
- Consumption of inulin has been associated with a lower risk of hypertension (Golzarand et al., 2022)
- Ingredients can be easily obtained
- No involvement of complex equipment
- Production scalability
- Increase in the demand of chocolate (Statista, 2023)



Global Chocolate Market (trillion US dollars)



INTELLECTUAL PROPERTY RIGHT
The formulation of GABA DACHO is under Trade Secret Protection.



USEFULNESS

- Ready-to-eat snack
- Prebiotics
- Potential health effects: anti-stress & anti-hypertension
- Can be used as nutritional or functional ingredients in other food products such as desserts and beverages