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Physical Characterization of Chocolate-Avocado Spread Incorporated with Monk Fruit (*Siraitia grosvenorii*)

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Structured Abstract

Background: In recent years, people have become more aware of the importance of maintaining good health, in line with Sustainable Development Goal (SDG) 3, which emphasizes good health and well-being. This study aims to develop a healthier chocolate spread by using monk fruit (*Siraitia grosvenorii*) as a natural sweetener and avocado fruit (*Persea americana*) as a source of healthy fat. Monk fruit is known for its intense sweetness without added calories, making it a suitable alternative to refined sugar. Meanwhile, avocado pulp is rich in monounsaturated fatty acids (MUFAs), which are associated with heart health and can also improve the creaminess and overall quality of the chocolate spread.

Methods: The physical analyses including total soluble solid, water activity, colour and texture profile, as well as its rheology properties of chocolate-avocado spread were analysed. Colour analysis was using the CIE Lab system to determine lightness (L*), redness/greenness (a*), and yellowness/blueness (b*). Texture analysis of the chocolate spread was performed to determine its hardness (N) and spreadability (N.mm) using a texture analyzer. The storage modulus (G′, elastic) and loss modulus (G″, viscous) of the chocolate spread were measured over 0–100 Hz, with all measurements performed in duplicate. Except for rheology, all analyses were conducted in triplicate for all chocolate-avocado spread formulations (Control: 0% AF & 0% MF, F1: 25% AF & 0% MF, F2: 0% AF & 10% MF, F3: 25% AF & 10% MF).

Results: The results demonstrated that the incorporation of monk fruit with the addition of avocado significantly affected the physical properties of the chocolate-avocado spread, as indicated by significant differences ($p<0.05$) in °Brix value, lightness (L*), spreadability (N·mm), and water activity. Rheological analysis showed that F1 (25% AF & 0% MF) and F3 (25% AF & 10% MF) exhibited dominant storage modulus (G′) over loss modulus (G″), indicating the elastic-dominant behaviour of spread and desirable structural stability.

Conclusion: In conclusion, the physical characterization of chocolate–avocado spread revealed significant differences ($p<0.05$) in °Brix, lightness (L*), spreadability (N.mm), and water activity among the formulations. Rheological analysis further indicated elastic-dominant behaviour in F1 and F3, demonstrating satisfactory structural stability of the chocolate spread.

Keywords: Monk Fruit, Avocado Fruit, Chocolate-Avocado Spread, MUFAs, Rheological

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