

SUBSTITUSI MOCAF DENGAN BIOMASSA SPIRULINA (*Arthrospira platensis*) TERDEODORISASI PADA BISKUIT *GLUTEN-FREE-VEGAN* TERHADAP KARAKTERISTIK SENSORIS, FISIK, DAN KIMIA

INTISARI

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Spirulina merupakan mikroalga yang dikenal sebagai "*superfood*" karena kandungannya yang tinggi akan protein, mineral, dan tinggi aktivitas antioksidan sehingga baik untuk dikonsumsi. Akan tetapi, inkorporasi spirulina dalam produk pangan sering kali menjadi hambatan karena aroma khas mikroalga yang menuurunkan keberterimaan produk pangan secara sensoris. Penelitian ini mengembangkan kukis *gluten-free-vegan* sebagai produk inklusif bagi individu dengan kebutuhan diet khusus, maupun gaya hidup berbasis nabati. Oleh sebab itu, penelitian ini bertujuan untuk mengetahui pengaruh substitusi biomassa spirulina terdeodorisasi pada persentase tertentu terhadap keberterimaan sensoris, serta karakteristik fisik dan kimia kukis *gluten-free-vegan*. Substitusi biomassa spirulina terdeodorisasi dilakukan pada beberapa tingkat persentase, yaitu 14% (P1), 21% (P2), 28% (P3), dan 35% (P4) dari massa MOCAF. Hasil uji sensoris menunjukkan terdapatnya perbedaan signifikan ($p < 0.05$) pada atribut warna, tekstur renyah, dan *sandy*, dengan persentase 21% (P2) merupakan perlakuan substitusi dengan tingkat keberterimaan tertinggi. Uji fisik menunjukkan terdapatnya perbedaan sifat rheologi dan *thermal properties* adonan, serta perbedaan signifikan sifat fisik kukis meliputi karakteristik mikrostruktur, porositas, *spread ratio*, tekstur, dan warna. Uji kimia menunjukkan perbedaan signifikan pada parameter kadar abu, protein, lemak, karbohidrat, profil kalori dan aktivitas antioksidan. Secara keseluruhan, substitusi MOCAF dengan biomassa spirulina terdeodorisasi berpengaruh signifikan terhadap karakteristik sensoris, fisik, dan kimia kukis *gluten-free-vegan*, dengan substitusi 21% dari massa MOCAF, sebagai perlakuan dengan tingkat keberterimaan terbaik secara sensoris.

Kata Kunci: spirulina, deodorisasi, kukis *gluten-free-vegan*, uji sensoris

MOCAF SUBSTITUTION WITH DEODORIZED SPIRULINA (*Arthrospira platensis*) BIOMASS IN GLUTEN-FREE-VEGAN COOKIES ON SENSORY, PHYSICAL, AND CHEMICAL CHARACTERISTICS

ABSTRACT

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Spirulina is a microalga known as a “superfood” owing to its remarkably high protein and mineral content, and its high antioxidant activity, making it beneficial for consumption. However, incorporating spirulina into food products is often constrained by its characteristic microalgal aroma, which reduces sensory acceptability. This study developed gluten-free-vegan cookies as an inclusive product for individuals with specific dietary needs and those who are adopting a plant-based lifestyle. Accordingly, this study aimed to investigate the effect of deodorized spirulina biomass substitution at certain percentages on the sensory acceptability, as well as physical and chemical characteristics of gluten-free-vegan cookies. Substitution of deodorized spirulina biomass was carried out at four levels, namely 14% (P1), 21% (P2), 28% (P3), and 35% (P4) of the MOCAF mass. Sensory evaluation showed significant differences ($p < 0.05$) in color, crispiness, and sandy texture attributes, with 21% substitution level (P2) being identified as the substitution level with the highest sensory acceptability. Physical analysis showed significant differences, including rheological and thermal properties of dough, as well as significant differences in cookie physical characteristics, including microstructure, porosity, spread ratio, texture, and color. Chemical analysis showed significant differences in ash, protein, fat, carbohydrate content, caloric profile, and antioxidant activity. Overall, MOCAF substitution with deodorized spirulina biomass significantly affected the sensory, physical, and chemical characteristics of gluten-free-vegan cookies, with a 21% MOCAF substitution level identified as the treatment with the highest sensory acceptability.

Keywords: spirulina, deodorization, gluten-free-vegan cookie, sensory evaluation