

PENGARUH SUBSTITUSI SUSU CAIR DENGAN SARI BUNGA TELANG (*Clitoria ternatea L.*) TERHADAP SIFAT FISIK DAN AKTIVITAS ANTIOKSIDAN PADA ES KRIM PROBIOTIK

Rania Windradi Sunarso¹, Lily Arsanti Lestari², Nurliyani³

ABSTRAK

Latar belakang: Kesadaran masyarakat terhadap kesehatan mendorong pengembangan pangan fungsional, termasuk es krim sebagai media penghantar probiotik. Namun, es krim konvensional cenderung tinggi gula dan lemak yang dapat meningkatkan risiko gangguan metabolik. Substitusi dengan bahan lokal yang kaya senyawa bioaktif, seperti sari bunga telang (*Clitoria ternatea L.*), menjadi peluang untuk meningkatkan sifat fisik dan aktivitas antioksidan es krim probiotik.

Tujuan: Untuk mengetahui pengaruh substitusi sari bunga telang (*Clitoria ternatea L.*) terhadap sifat fisik dan aktivitas antioksidan pada es krim probiotik *Lactiplantibacillus plantarum* subsp. *plantarum* Dad-13.

Metode: Penelitian eksperimental dengan Rancangan Acak Lengkap (RAL) 1 faktor. Substitusi susu cair dengan sari bunga telang berbagai konsentrasi sebesar 0%, 20%, dan 30% (v/v) pada pembuatan es krim probiotik. Analisis yang dilakukan meliputi sifat fisik (*overrun*, waktu leleh, dan pH) serta aktivitas antioksidan metode DPPH.

Hasil penelitian: Hasil penelitian menunjukkan substitusi sari bunga telang berpengaruh nyata ($p < 0,05$) terhadap peningkatan *overrun*, waktu leleh, dan aktivitas antioksidan serta penurunan pH. Substitusi 30% menghasilkan *overrun* tertinggi (38,63%), aktivitas antioksidan tertinggi (IC_{50} : 136,22 $\mu\text{g/mL}$), dan waktu leleh terlama (47,68 menit), dengan penurunan pH menjadi 5,44.

Kesimpulan: Penambahan persentase substitusi sari bunga telang dengan susu cair meningkatkan aktivitas antioksidan, *overrun*, dan waktu leleh, serta menurunkan pH pada es krim probiotik *Lactiplantibacillus plantarum* subsp. *plantarum* Dad-13. Hal tersebut menunjukkan penambahan sari bunga telang meningkatkan kualitas fisik dan antioksidan es krim probiotik.

Kata kunci: Es krim probiotik; *Lactiplantibacillus plantarum* subsp. *plantarum* Dad-13; *Clitoria ternatea L.*; sifat fisik; aktivitas antioksidan.

¹Mahasiswa Program Studi Gizi Kesehatan FK-KMK UGM

²Dosen Program Studi Gizi Kesehatan FK-KMK UGM

³Dosen Departemen Teknologi Hasil Peternakan Fakultas Peternakan UGM

EFFECT OF WHOLE MILK SUBSTITUTION WITH BUTTERFLY PEA FLOWER ESSENCE (*Clitoria ternatea* L.) ON THE PHYSICAL PROPERTIES AND ANTIOXIDANT ACTIVITY OF PROBIOTIC ICE CREAM

Rania Windradi Sunarso¹, Lily Arsanti Lestari², Nurliyani³

ABSTRACT

Background: Public awareness of health has driven the development of functional foods, including ice cream as a potential carrier for probiotics. However, conventional ice cream tends to be high in sugar and fat, which may increase the risk of metabolic disorders. Substitution with local ingredients rich in bioactive compounds, such as butterfly pea flower essence (*Clitoria ternatea* L.), presents an opportunity to improve the physical properties and antioxidant activity of probiotic ice cream.

Objectives: To determine the effect of substituting butterfly pea flower essence (*Clitoria ternatea* L.) on the physical properties and antioxidant activity of probiotic ice cream containing *Lactiplantibacillus plantarum* subsp. *plantarum* Dad-13.

Methods: This study was an experimental research using a Completely Randomized Design (CRD) with one factor. The formulation involved substituting whole milk with butterfly pea flower essence at concentrations of 0%, 20%, and 30% (v/v) in probiotic ice cream. The parameters analyzed were physical properties (overrun, melting time, and pH) and antioxidant activity using the DPPH method.

Results: The results showed that butterfly pea flower substitution had a significant effect ($p < 0.05$) on increasing overrun, melting time, and antioxidant activity, while decreasing pH. The 30% substitution produced the highest overrun (38.63%), the highest antioxidant activity (IC_{50} : 136.22 $\mu\text{g/mL}$), and the longest melting time (47.68 minutes), along with the lowest pH (5.44).

Conclusions: Substituting butterfly pea flower essence for whole milk increases antioxidant activity, overrun, and melting time, while decreasing pH in probiotic ice cream containing *Lactiplantibacillus plantarum* subsp. *plantarum* Dad-13. These findings indicate that the addition of butterfly pea flower essence enhances the physical and antioxidant quality of probiotic ice cream.

Keywords: Probiotic ice cream; *Lactiplantibacillus plantarum* subsp. *plantarum* Dad-13; *Clitoria ternatea* L.; physical properties; antioxidant activity.

¹Student of Nutrition Health Study Program, Faculty of Medicine, Public Health, and Nursing, UGM

²Lecturer of Nutrition Health Study Program, Faculty of Medicine, Public Health, and Nursing, UGM

³Lecturer of Animal Product Technology, Faculty of Agricultural and Veterinary Sciences, UGM