

Analisis Pengaruh Suhu dan Lama Penyimpanan Terhadap Aktivitas Antioksidan dan Total Flavonoid Minuman *Nano White Tea* Sebagai Pangan Fungsional

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ABSTRAK

Latar Belakang: Teh putih mengandung antioksidan yang berperan penting sebagai senyawa bioaktif, namun mudah terdegradasi akibat suhu dan lama penyimpanan. Penggunaan nanoteknologi, seperti ultrasonikasi, menghasilkan partikel nano yang lebih stabil dan efektif dalam mempertahankan senyawa tersebut.

Tujuan: Menganalisis pengaruh suhu dan lama penyimpanan terhadap aktivitas antioksidan dan total flavonoid minuman *nano white tea*.

Metode: Penelitian eksperimental metode rancangan acak lengkap faktorial melalui variasi suhu (4°C dan 25°C) dan waktu penyimpanan (0, 3, 6, 12, 24, 48, dan 72 jam). Analisis antioksidan dilakukan menggunakan DPPH. Analisis total flavonoid menggunakan metode $AlCl_3$.

Hasil: Terdapat perbedaan signifikan (p -value < 0,05) nilai IC_{50} dan total flavonoid teh putih seduhan dan minuman *nano white tea*. Suhu dan lama penyimpanan memengaruhi kestabilan aktivitas antioksidan dan flavonoid total, dengan penurunan paling signifikan pada suhu 25°C. Minuman *nano white tea* memiliki stabilitas yang lebih baik dibandingkan seduhan teh putih, khususnya pada suhu 4°C.

Simpulan: Suhu dan lama penyimpanan memengaruhi kestabilan aktivitas antioksidan dan total flavonoid. Penurunan paling besar terjadi pada teh putih seduhan dengan suhu 25°C. Minuman *nano white tea* menunjukkan kestabilan yang lebih baik pada suhu 4°C.

Kata Kunci: aktivitas antioksidan, total flavonoid, teh putih, ultrasonikasi

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Analysis of the Effect of Temperature and Storage Duration on Antioxidant Activity and Total Flavonoids of Nano White Tea Beverage as a Functional Food

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ABSTRACT

Background: White tea contains antioxidants that play important roles as bioactive compounds, but easily degraded due to temperature and storage duration. The application of nanotechnology, such as ultrasonication, enables the formation of more stable and effective nano-sized particles to preserve these compounds.

Objective: To analyze the effect of temperature and storage duration on the antioxidant activity and total flavonoids of nano white tea beverages.

Methods: This experimental study employed a completely randomized factorial design with variations in temperature (4–6°C and 25–27°C) and storage time (0, 3, 6, 12, 24, 48, and 72 hours). Antioxidant activity was measured using the DPPH method, and total flavonoids were analyzed by the AICl₃ method.

Results: Significant differences (p-value < 0.05) were found in IC₅₀ values and total flavonoid content between brewed white tea and nano white tea beverages. Temperature and storage duration affected the stability of antioxidant activity and total flavonoids, with the most significant decrease observed at 25°C. Nano white tea beverages exhibited better stability compared to brewed white tea, especially at 4°C.

Conclusion: Temperature and storage duration influence the stability of antioxidant activity and total flavonoids. The greatest decrease occurred in brewed white tea stored at 25°C. Nano white tea beverages demonstrated better stability at 4°C.

Keywords: antioxidant activity, total flavonoids, white tea, ultrasonication

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