

EFFECT OF IN FILM PACKAGING TYPE ON THE PHYSICAL AND CHEMICAL PROPERTIES OF EDAMAME DURING STORAGE

ABSTRACT

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Edamame is well known for its high nutritional content and sensory characteristics, however reduction in its quality begin rapidly once harvested. Consequently, the suitable packaging to optimize the storage condition is important in order to maintain its quality during storage. This study was conducted to observe the effects of three types of film packaging on the physical and chemical properties of edamame during storage for 6 days at 23°C and 28 days at 10°C.

Edamame were packed in film packaging with different atmospheric condition, i.e. (in percentage) 6:75/O₂:CO₂ (Film A₂₃), 10:23/O₂:CO₂ (Film B₂₃), and 17:8/O₂:CO₂ (Film C₂₃) stored at 23°C and 6:55/O₂:CO₂ (Film A₁₀), 10:18/O₂:CO₂ (Film B₁₀), and 19:1/O₂:CO₂ (Film C₁₀) stored at 10°C. Colorimetric method was performed to measure color value. HPLC analysis was performed to analyze sugar content. Ninhydrin assay method was performed to analyze amino acid content.

In storage at 23°C, the hue angle of film A₂₃ was higher than that of film B₂₃ and C₂₃. The total sugar in film B₂₃ and C₂₃ were significantly ($p < 0.05$) higher than that of film A₂₃. The total amino acid in film A₂₃ and B₂₃ were significantly ($p < 0.05$) higher than those in film C₂₃. Mold growth was detected on film B₂₃ and C₂₃ after 6d and 4d respectively. In storage at 10°C, the hue angle of film A₁₀ was higher than those in film B₁₀ and C₁₀. The total sugar in film B₁₀ and C₁₀ were significantly ($p < 0.05$) higher than those in film A₁₀. The total amino acid in film A₁₀ were significantly ($p < 0.05$) higher than those in film B₁₀ and C₁₀. Mold growth was detected on film B₁₀ and C₁₀ after 14d. Consumption before 2, 4, and 2d when stored at 23°C in film A₂₃, B₂₃, and C₂₃ respectively and before 10, 14 and 14d when stored at 10°C in film A₁₀, B₁₀, and C₁₀ respectively is recommended.

Keywords: Edamame, O₂, CO₂ film packaging, storage, pod color, sugar, amino acid

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PENGARUH JENIS KEMASAN FILM PADA SIFAT FISIK DAN KIMIA EDAMAME SELAMA PENYIMPANAN

INTISARI

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Edamame dikenal dengan kandungan nutrisi dan karakteristik sensorisnya yang tinggi, namun penurunan kualitasnya berlangsung cepat setelah dipanen. Oleh karena itu, pengemasan yang sesuai untuk mengoptimalkan kondisi penyimpanan menjadi penting untuk menjaga kualitasnya. Penelitian ini dilakukan untuk mengetahui pengaruh tiga jenis kemasan film terhadap sifat fisik dan kimia dalam penyimpanan selama 6 hari pada suhu 23°C dan 28 hari pada suhu 10°C.

Edamame dikemas dalam kemasan film dengan kondisi atmosfer yang berbeda, yaitu (dalam persentase) 6:75/O₂:CO₂ (Film A₂₃), 10: 23/ O₂:CO₂ (Film B₂₃), dan 17: 8/O₂:CO₂ (Film C₂₃) disimpan pada suhu 23°C dan 6:55/O₂:CO₂ (Film A₁₀), 10:18/O₂:CO₂ (Film B₁₀), dan 19:1/O₂:CO₂ (Film C₁₀) disimpan pada suhu 10°C. Metode kolorimetri dilakukan untuk mengukur nilai warna. Analisis HPLC dilakukan untuk menganalisis kadar gula. Metode uji ninhidrin dilakukan untuk menganalisis kandungan asam amino.

Penyimpanan pada suhu 23°C, sudut rona film A₂₃ lebih tinggi daripada film B₂₃ dan C₂₃. Total gula dalam film B₂₃ dan C₂₃ secara signifikan ($p < 0,05$) lebih tinggi daripada film A₂₃. Total asam amino dalam film A₂₃ dan B₂₃ secara signifikan ($p < 0,05$) lebih tinggi daripada film C₂₃. Pertumbuhan jamur terdeteksi pada film B₂₃ dan C₂₃ masing-masing setelah 6h dan 4h. Dalam penyimpanan pada suhu 10°C, sudut rona film A₁₀ lebih tinggi daripada film B₁₀ dan C₁₀. Total gula dalam film B₁₀ dan C₁₀ secara signifikan ($p < 0,05$) lebih tinggi daripada jika film A₁₀. Total asam amino dalam film A₁₀ secara signifikan ($p < 0,05$) lebih tinggi dari pada film B₁₀ dan C₁₀. Pertumbuhan jamur terdeteksi pada film B₁₀ dan C₁₀ setelah 14h. Direkomendasikan untuk mengonsumsi edamame sebelum 2, 4, dan 2 hari ketika disimpan pada suhu 23°C dalam film A₂₃, B₂₃, dan C₂₃ berurutan dan sebelum 10, 14 dan 14 hari ketika disimpan pada 10°C dalam film A₁₀, B₁₀, dan C₁₀ berurutan.

Kata kunci: Edamame, O₂, CO₂, kemasan film, penyimpanan, warna polong, gula, asam amino

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