

EFFECT OF STORAGE CONDITION TO PREVENT SUGAR BLOOMING FORMATION ON DRIED BANANA PRODUCT

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**DEPARTMENT OF AGROINDUSTRIAL TECHNOLOGY
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ABSTRACT

MANDA LAVINA NATHANIA, Effect of Storage Condition to Prevent Sugar Blooming Formation on Dried Banana. Supervised by TITI CANDRA SUNARTI and ENDANG WARSIKI.

Storage temperature, humidity control, and packaging type play a crucial role in maintaining the quality and preventing sugar bloom in solar-dried Mali Ong bananas (*Musa sapientum* Linn.) produced by Hillkoff, Thailand. Sugar bloom, a white crystalline layer formed from the re-crystallization of reducing sugars such as glucose and fructose, can mislead consumers into perceiving the product as spoiled, despite no changes in flavor or texture. In this study, vacuum and non-atmospheric packaging were tested under ambient (20–30 °C, 40–80% RH) and cold storage (4–6 °C, 65–70% RH) for 45 days. Cold storage with controlled humidity, particularly when combined with vacuum packaging, maintained stable water activity, minimized moisture fluctuations, and completely prevented sugar bloom. Conversely, ambient storage conditions led to higher fluctuations in water activity and moisture content, greater reducing sugar-to-water ratios, and increased sugar bloom occurrence. These results emphasize the importance of controlling water activity through optimal storage conditions to preserve product appearance, texture, and consumer acceptance.

Keywords: dried banana, vacuum packaging, cold storage, sugar blooming, shelf life



ABSTRAK

MANDA LAVINA NATHANIA. *Efek Kondisi Penyimpanan dalam Pencegahan Pembentukan Kristalisasi Gula pada Produk Pisang Kering. Dibimbing oleh TITI CANDRA SUNARTI dan ENDANG WARSIKI.*

Suhu penyimpanan, kontrol kelembaban, dan jenis kemasan berperan penting dalam menjaga kualitas dan mencegah sugar bloom pada pisang kering matahari varietas Mali Ong (Musa sapientum Linn.) produksi Hillkoff, Thailand. Sugar bloom, yaitu lapisan kristal putih hasil rekristalisasi gula pereduksi seperti glukosa dan fruktosa, sering disalahartikan konsumen sebagai tanda kerusakan produk, meskipun rasa dan teksturnya tidak berubah. Dalam penelitian ini, kemasan vakum dan non-atmosfer diuji pada kondisi penyimpanan ambien (20–30 °C, 40–80% RH) dan dingin (4–6 °C, 65–70% RH) selama 45 hari. Penyimpanan dingin dengan kelembaban terkontrol, terutama bila dikombinasikan dengan kemasan vakum, mampu menjaga aktivitas air tetap stabil, meminimalkan fluktuasi kelembaban, dan sepenuhnya mencegah sugar bloom. Sebaliknya, penyimpanan ambien menyebabkan fluktuasi aktivitas air dan kadar air yang lebih besar, rasio gula pereduksi terhadap air yang lebih tinggi, serta peningkatan kejadian sugar bloom. Hasil ini menegaskan pentingnya pengendalian aktivitas air melalui kondisi penyimpanan yang optimal untuk menjaga tampilan, tekstur, dan penerimaan konsumen.

Kata kunci: pisang kering, pengemasan vakum, penyimpanan dingin, kristalisasi gula, umur simpan

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MANDA LAVINA NATHANIA

Undergraduate Thesis

One of the requirements for obtaining a Bachelor of Engineering Degree with
Honours in Agroindustrial Engineering Study Program

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PREFACE

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Bogor, August 2025

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