



FINANCIAL ANALYSIS OF IMPROVED METHODS TO PREVENT SUGAR BLOOM FORMATION FOR DRIED BANANA PRODUCTS

NAUFAL FAADHIL HANIF



**DEPARTMENT OF AGROINDUSTRIAL TECHNOLOGY
FACULTY OF AGRICULTURAL TECHNOLOGY AND ENGINEERING
IPB UNIVERSITY BOGOR
2025**

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ABSTRACT

NAUFAL FAADHIL HANIF. Financial Analysis of Improved Methods to Prevent Sugar Bloom Formation for Dried Banana Products. Supervised by ELISA ANGGRAENI and ENDANG WARSIKI.

Hillkoff is a well-established agroindustry located in Chiang Mai, Thailand, specializing in innovative agricultural products, including its dried banana snacks. These bananas are processed using sustainable techniques that preserve flavor, nutrients, and extend shelf life, while offering various unique flavors such as espresso, cappuccino, chocolate, matcha, and pumpkin alongside the original version. The product is marketed as a premium healthy snack and is widely distributed both domestically and internationally. However, one of the persistent challenges faced in production is sugar bloom, a crystallization of sugar that appears on the surface of the banana. While it does not affect taste or safety, the visual appearance of sugar bloom is often mistaken by consumers as mold or spoilage, which lowers product acceptance and forces the company to either discard or repurpose affected products. This leads to increased costs and reduced profitability, making sugar bloom a critical financial concern for Hillkoff. This study evaluates the financial feasibility of two improvement methods aimed at minimizing sugar bloom in industrial production. Under existing conditions for 45 days stock, the cost of goods manufactured (COGM) is 15.07 \$/Pcs, with a monthly profit of 17,183.56 \$. The process improvement method, which involves the use of citric acid, reduces COGM by 9.29% to 13.67 \$/Pcs and increases profit by 14.71% to 19,712.53 \$/month, resulting in a net benefit of 2,528.97 \$/month. Meanwhile, the post-process improvement method, which applies cold storage, lowers COGM by 14.27% to 12.92 \$/Pcs and raises profit by 23.54% to 21,229.48 \$/month, generating a higher net benefit of 4,045.92 \$/month. Financial analysis shows both methods are feasible, as indicated by positive Net Present Value (NPV) and Benefit Cost Ratio (B/C), with viability maintained when sugar bloom occurrence stays below 26.35% for the process improvement and 27.03% for the post-process improvement.

Keywords: financial analysis, dried banana, improvement methods, sugar bloom

ABSTRAK

NAUFAL FAADHIL HANIF. Analisis Finansial pada Perbaikan Metode untuk Mencegah Formasi Kristal Gula pada Produk Pisang Kering. Dibimbing oleh ELISA ANGGRAENI dan ENDANG WARSIKI.

Hillkoff adalah perusahaan agroindustri berbasis di Chiang Mai, Thailand, yang berspesialisasi dalam produk pertanian inovatif, termasuk camilan pisang sale (dried banana). Produk pisang ini diproses menggunakan teknik berkelanjutan yang menjaga cita rasa, kandungan nutrisi, serta memperpanjang masa simpan, dengan berbagai varian rasa unik seperti espresso, cappuccino, cokelat, matcha, dan labu, selain varian original. Produk ini dipasarkan sebagai camilan sehat premium yang telah tersebar luas baik di pasar domestik maupun internasional. Namun, salah satu tantangan utama dalam proses produksinya adalah sugar bloom, yaitu kristalisasi gula yang muncul di permukaan pisang. Meskipun tidak memengaruhi rasa maupun keamanan produk, tampilan visual sugar bloom seringkali disalahartikan konsumen sebagai jamur atau tanda kerusakan, sehingga menurunkan kepercayaan dan daya tarik produk. Hal ini membuat perusahaan terpaksa membuang atau mengalihfungsikan produk yang terdampak, yang berujung pada peningkatan biaya dan penurunan profitabilitas. Oleh karena itu, sugar bloom menjadi permasalahan finansial yang penting untuk Hillkoff. Penelitian ini mengevaluasi kelayakan finansial dari dua metode perbaikan yang bertujuan untuk meminimalkan terjadinya sugar bloom pada produksi skala industri. Dalam kondisi eksisting untuk stok 45 hari, biaya pokok produksi (COGM) tercatat sebesar 15.07 \$/Pcs, dengan profit bulanan sebesar 17,183.56 \$. Metode perbaikan proses yang menggunakan penambahan 0.35% asam sitrat mampu menurunkan COGM sebesar 9.29% menjadi 13.67 \$/Pcs dan meningkatkan profit sebesar 14.71% menjadi 19,712.53 \$/bulan, dengan net benefit sebesar 2,528.97 \$/bulan. Sementara itu, metode perbaikan pasca-proses yang melibatkan penyimpanan dingin menurunkan COGM sebesar 14.27% menjadi 12.92 \$/Pcs dan meningkatkan profit sebesar 23.54% menjadi 21,229.48 \$/bulan, menghasilkan net benefit yang lebih tinggi sebesar 4,045.92 \$/bulan. Analisis finansial menunjukkan bahwa kedua metode tersebut layak diterapkan, ditunjukkan oleh nilai Net Present Value (NPV) dan Benefit Cost Ratio (B/C) yang positif, dengan kelayakan tetap terjaga selama kejadian sugar bloom berada di bawah 26.35% untuk metode perbaikan proses dan di bawah 27.03% untuk metode perbaikan pasca-proses.

Kata kunci: analisis finansial, pisang sale, perbaikan metode, kristalisasi gula



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NAUFAL FAADHIL HANIF

Undergraduate Final Project
One of the requirements for obtaining a Bachelor of Engineering Degree with
Honours in Agro-Industrial Engineering Study Program

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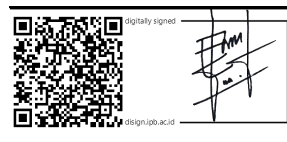
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PREFACE

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Bogor, July 2025

Naufal Faadhil Hanif

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