4TH EDITION

E-EXTENDED

ABSTRACT

INTERNATIONAL AGROTECHNOLOGY INNOVATION SYMPOSIUM (i-AIS)

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19 June 2023

Faculty of Plantation and Agrotechnology UiTM Cawangan Melaka Kampus Jasin

Published 2023
Faculty of Plantation and Agrotechnology
Universiti Teknologi MARA Cawangan Melaka Kampus Jasin
77300 Merlimau Melaka.

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Mode of access Internet

https://sites.google.com/view/ais2023/publication

Perpustakaan Negara Malaysia Cataloguing -in – Publication Data

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ABOUT FACULTY OF PLANTATION AND AGROTECHNOLOGY

The Faculty of Plantation and Agrotechnology was established in 2010 at Universiti Teknologi MARA (UiTM). The mission of the faculty is to play the vital role of producing well-trained professionals in all areas of plantation and agriculture-related industries at national and international levels.

Bachelor of Science (Hons) Plantation Technology and Management is a three-year program that strongly emphasizes the various aspects of Production Technology, Management, and Information Technology highly sought after by the agricultural and plantation sectors. Students in this program will be fully trained to serve as professionals in the plantation sector and related industries. They will have ample opportunities to fulfill important positions in the plantation industry such as plantation executives. This program provides a strong balance of technology and management courses essential for the plantation industry such as management of plantation crops, soil fertility, plantation management operation, plantation crop mechanization, and agricultural precision. As an integral part of the program, students will be required to undergo industrial attachment to gain managerial skills in the plantation industry.

The faculty is highly committed to disseminating, imparting, and fostering intellectual development and research to meet the changing needs of the plantation and agriculture sectors. With this regard, numerous undergraduate and postgraduate programs have been offered by the government's intention to produce professionals and entrepreneurs who are knowledgeable and highly skilled in the plantation, agriculture, and agrotechnology sectors.

PREFACE

International Agrotechnology Innovation Symposium (i-AIS) is a platform to be formed for students/lecturers/ staff to share creativity in applying the knowledge that is related to the world of Agrotechnology in the form of posters. This virtual poster competition takes place on the 1st of December 2022 and ends on the 8th of January 2023. This competition is an assessment of students in determining the level of understanding, creativity, and group work for the subject related to agrotechnology and being able to apply it to the field of Agrotechnology. The i-AIS 2022 program takes place from December 1, 2022, to January 8, 2023. The program was officiated by the Dean of the Faculty of Plantation and Agrotechnology, namely Prof. Madya Ts. Dr. Azma Yusuf. The program involves students from faculties of the Faculty of Plantation and Agrotechnology (FPA)and HEP participating in i-AIS 2022, namely, the Faculty of Education and Pre-Higher Education. This program involves the UiTM student and some of the non-UiTM students which come from the international university and the local university. Two categories are contested, namely UiTM and non-UiTM. To date, students from these programs have shown remarkable achievements in academic performance and participation in national as well as international competitions.

This competition is an open door for the students and lecturers to exhibit creative minds stemming from curiosity. Several e-content projects have been evaluated by esteemed judges and that has led to the birth of this E-Poster Book. Ideas and novelties are celebrated, and participants are applauded for displaying ingenious minds in their ideas.

It is hoped that such an effort continues to breed so that there is always an outlet for these creative minds to grow.

Thank you.

Dean
On behalf of the Organizing Committee
Conference Chair
Universiti Teknologi MARA
Faculty of Plantation and Agrotechnology
http://fpa.uitm.edu.my

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PALM OIL CARTON PACKAGING

Austine Anak Polly[1], Charmine Sharmine Anak Stanley[1], Erra Fazira Anak Nyanggau[1]

[1]*Universiti Teknologi MARA, Malaysia*

Corresponding author e-mail: austinepolly689@gmail.com.my

ABSTRACT- Palm oil is a vegetable-derived dark yellow to yellow-red oil with a high amount of beta-carotene that is produced by pressing or boiling the flesh of the oil palm fruit (*Elaeis guineensis*). When compared to palm kernel oil, which is made from the oil palm's kernels, palm oil is different. The precautions in milling and refining processes, the impacts of oxidation, hydrolysis, contamination, and cross-contamination on palm oil during storage, handling, and transportation are described. Due to the large amount of oil palm goods that Malaysia produces and exports, they are handled, stored, and transported in bulk, which raises the possibility of some quality degradation. Oils suffered more damage when kept at 45°C and 30– 40% relative humidity (RH), demonstrating that the combined effects of moisture and temperature are larger than the effects of high RH alone (92%), even at lower temperatures. Films using polyamide as one of the layers contribute to less quality degradation, and films with ethylene acrylic acid as the sealant layer experienced very little leakage. The findings demonstrated that to optimize profit, it is best to avoid prolonged storage periods and pack palm oil in a few of weeks after it has been processed. This paper will provide details on how temperature, storage conditions, and storage duration affect the quality of palm oil, managing customer and food industry in determining the best time to storage their commodities.

Keywords: Palm Oil, Quality, Temperature, Storage, Packaging Material.

INTRODUCTION

The most adaptable oil is palm oil, which may be utilized in a variety of food and non-food applications with or without relatively minor modifications. Since it may replace other vegetable and animal oils used in the processing industries, it is in extremely high demand. The estimated global consumption of palm oil is 74% for food goods and 24% 33% for industrial uses (USDA 2010). Food products including margarine, biscuits, and milk frequently use palm oil as an ingredient. In the non-food sector, oleo chemicals from palm oil are used to make home goods like detergents and soap. (Alang Mahat, 2012)

An important crop in the tropics that produces a lot of oil per unit of area is oil palm. The potential production of oil palm has been increased by four to five times thanks in large part to genetic enhancement. Mesocarp content was impacted by hybridization and selection mostly at shell thickness. The transcriptomes of oil palm genes related to tissues, flowering, mesocarp and oil yield and quality features, somatic embryogenesis, and mantled disease are effectively analyzed using genomic technologies. The high diversity of oil palm germplasm in Nigeria and its low diversity in Ghana are studied using molecular markers. For the traits of virescens, shell thickness, and oil quality, marker-trait associations and QTL maps are investigated. Cloned and sequenced genes include those that control the MADS box, somatic embryogenesis, oil yield and quality, as well as promoters unique to mesocarp or leaf tissues. The opportunity for large-scale genetically engineered production of oil palm compounds is provided by the unit area's high dry matter production. The gene mapping of additional crucial oil palm features, such as dwarf habit and disease resistance, sets the direction for future genomics research. (Arunachalam, 2012)

The following storage methods were used to store crude palm oil (CPO), refined palm oil (RPO), refined palm olein (RPOL), and refined palm stearin (RPS): away from light (20–25 °C, acclimated environment); in a refrigerator (4–8 °C); and at room temperature (26–32 °C), exposed to natural light. FFA percentage, peroxide value, and meq O2/kg), induction time (h), total carotenoids (ppm), and color measurements (CIELab) were examined to ascertain the stability of oils monthly up to a total of 12 months. Except for one sample of CPO, all the crude and refined starting oils were of high grade.

The oxidative processes were accelerated by light exposure and storage between 26 and 32 °C. When kept at 20–25 °C and in the dark, the estimated shelf lives of CPO, RPO, RPOL, and RPS would be 6, 9, and 12 months,

respectively. When compared to oils stored in various storage conditions, oils of the highest quality were found to be stored at 4–8 °C. (Almeida, Viana, Silva, & Costa, 2019)

Liquid Packaging Board, or LPB for short, is used to package liquid goods and beverages. For more than 40 years, LPB has been used as a container for packing both liquid and creamy goods such milk, soup, juice, cream, custard, and sauces. It guards against the possibility of external influences contaminating the food ingredients, which could harm the finished goods. Consumers can find ingredients and nutritional details about a product on the exterior layer of the packaging. For the food and beverage quality, the packaging materials and methods must be top-notch. because the food and drink will come into direct contact with the package's inner layer. LPB has a strong wet sizing, high rigidity, and a high barrier plastic coating (polyethylene). The liquid is contained by four layers of plastic (polyethylene) to avoid leaks and airflow migration. Any flavor or scent that can impact the product's composition should not be present in the plastic.

A multi-ply paperboard called liquid packing board has layers of polyethylene, aluminium, paper, polyethylene, and polyethylene. Paper waste from a paper mill is utilized as the packaging's second-last ply before plastic, adding bulk and rigidity. Applications for printing employ the paper board. A layer of aluminium foil is utilized as a barrier and a heating element. Paper packaging is protected by the top layer of plastic. While various layers of plastic are employed depending on the product's application. Plastic makes up the layer that is directly in contact with the product. The two most common forms of liquid packaging board are. The one has a limited shelf life, whereas the other has a long one. Low-density polyethylene is barrier coated on both sides of packages with a limited shelf life. Aluminium foil and polyethylene are used as a barrier covering in packaging with a long shelf life. The products are heated up before packaging, which helps conserve energy because it eliminates the need for refrigeration before usage. (Kharel, 2022)

SCOPE

This study is involved in the postharvest handling of palm oil and its refer to the packaging of the product.

OBJECTIVE

The study is conducted to reduce the usage of plastic in packaging of palm oil and to avoid the leaking of the palm oil while been storage at the store and the supermarket while delivering it to the consumer.

MATERIAL AND METHOD

Secondary and tertiary sources are combined, indexed, or organized in tertiary resources, frequently to give a general overview of the many packaging options for palm oil. Rarely does this kind of content contain unique content. As with the sources listed in a bibliography, works cited, or reference list, tertiary materials are typically a reliable source of information and facts provided in context to analyze a topic.

Liquid paperboard (LPB), which is formed of layers of paperboard and additional protective layers to keep contents secure, is the main component of palm oil cartons. While long-life products have a small layer of aluminium foil as a light and oxygen barrier, gable-top cartons used for palm oil favorable temperature 30 degree celsius, only have plastic protective layers. In both situations, paperboard accounts for the biggest amount of these components; for instance, a 1 liter carton of palm oil contains 88% paperboard. Simple thick paper-based material called paperboard is both renewable and recyclable.

RESULTS AND DISCUSSION

The use of LPB as an alternative to plastic bag is better for packaging. First of all, it can ease the storage. The plastic bag packaging is not stiff which is the main cause of slip and fall while handling the product. It will break of will cause some leakage after taking the damage from the fall. Unlike plastic bag packaging, it has fixed box shape. It can be arranged and stored securely. During the idea generation of our product, we considered to reduce plastic waste as one of our ideas. The LPB also contain very thin but durable layer of polyethylene

but at least low plastic usage brings low plastic wastes. It also easy to use. Plastic bag packaging of palm oil after being cut open, the oil must be transferred to another container. By using our product, the oil does not need to transfer to another container because it has a resealable cap. As the results, the leaking problems and plastic usage can significantly reduce.

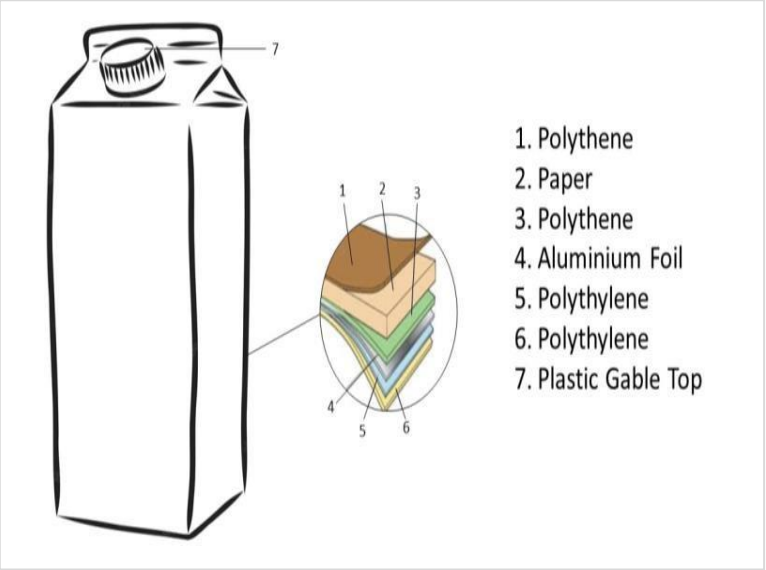

Figure 1: LPD Packaging

Table 1: Table Header

Method	Result 1	Result 2
LPD packaging	Reduce plastic waste	Reduce plastic usage
Resealable top	Can be used until finished	Does not need to transfer oil to another container
Fixed box shape	Easy to handle	Reduce leakage problems

CONCLUSION

LPB, or liquid packaging board, is a superior solution for packaging palm oil. LPB features a high barrier plastic coating, strong wet sizing, and stiffness. LPB is preferable than plastic bags when used for packing. It can make storing easier. It features a set box shape as opposed to plastic bag packaging. It can be handled safely. We thought one of our ideas may be to lessen plastic waste can be accomplished. A very thin but sturdy coating of polyethylene is also present in the LPB, but at least less plastic is used, therefore there are fewer plastic wastes. It is also simple to use as a result of the resealable top on our product, there is no need to transfer the oil to another container. This characteristic can attract consumer to use our products. Our goal of reducing plastic usage and leakage problems can expected to be carry through in the future.

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e ISBN 978-629 -97220-6-9

9 786299 722069

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Fakulti Perladangan dan Agroteknologi

INTERNATIONAL AGROTECHNOLOGY INNOVATION SYMPOSIUM

ais2023.fpa@gmail.com