

4TH EDITION

**E-EXTENDED
ABSTRACT**

INTERNATIONAL AGROTECHNOLOGY INNOVATION SYMPOSIUM (i-AIS)



COPYRIGHT

INTERNATIONAL AGROTECHNOLOGY INNOVATION SYMPOSIUM (i-AIS)

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.

E-EXTENDED ABSTRACT of the INTERNATIONAL AGROTECHNOLOGY INNOVATION SYMPOSIUM (i-AIS) (4th EDITION)

Mode of access Internet

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

Perpustakaan Negara Malaysia Cataloguing -in – Publication Data

ORGANIZING COMMITTEE

Program Advisor	:	Ts. ChM. Dr. Wan Zuraida Wan Mohd Zain
Program Director	:	Dr. Noer Hartini Dolhaji
Program Secretary	:	Nurul Izzatiafifi Ismail
Program Treasurer	:	Nur' Amira Hamid
Program Registration	:	Siti Aisha Na'illa Che Musa
Program Judging	:	Nur Atiqah Zaharullil Nur Wajihah Mohd Naw
Program Webmaster	:	Ts. Dr. Siti Fairuz Nurr Sadikan
Program Certificate		Nurul Wahida Ramli
Program Human Contribution		Nur Nabila Huda Aziz
Program Protocol		Siti Nur Atikah Abu Samah
Program Publication		Dr. Mohd Zuli Jaafar
Program Logistic		Muhammad Nuruddin Mohd Nor
Program Technical		Khawarizmi Mohd Aziz

STUDENT COMMITTEE

Mohammad Ali Kamaruddin
Nurul Huda Nabilah Ramlee
Siti Nor Arifah Abd Halim
Nuraliah Aqilah Ayuni Mohamed
Mohamad Khairul Haziq Mohamad Fauzi
Nur Wajihah Mohd Nawawi
Mohammad Hafis Ayub
Aiman Haziq Arifin
Amyra Hazwani Ghazali
Mohamad Syamil Mohd Nor
Mohammad Najmuddin Suriani
Nur Syafiqah Aina Azmi
Muhammad Aidil Ikhwan Kamarudin
Nur Muhammad Ameiriqwan Ahmad Faiza
Muhammad Faiz Zulazmi
Mohd Azri Aiman Zulkifli
Diana Asykin Kamaruddin
Nor Elin Balqis Ismail
Nursyasya Razalil
Muhammad Ismadanial Rozi
Muhammad Amir Asyraf Azman
Mohamad Zairy Zailan

EDITORIAL BOARD

Patron

Prof Ts Dr Azhan Hashim @ Ismail

Advisors

Prof Madya Ts. Dr. Fazleen Abdul Fatah

Ts. ChM Dr. Wan Zuraida Wan Mohd Zain

Dr. Noer Hartini Dolhaji

Editors

Dr. Mohd Zuli Jaafar

Dr. Wan Zuraida Wan Mohd Zain

Dr Noer Hartini Dolhaji

Muhammad Aidil Ikhwan Kamarudin

Abdul Quddus bin Puteh

Nurul Izzatiafifi Ismail

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>

TABLE OF CONTENTS

1.	COPYRIGHT	i
2.	ORGANIZING COMMITTEE	ii
3.	STUDENT COMMITTEE	iii
4.	EDITORIAL BOARD	iv
5.	ABOUT FACULTY OF PLANTATION AND AGROTECHNOLOGY	v
6.	PREFACE	vi
7.	TABLE OF CONTENTS	vii
8.	GOLD AWARD.....	1
9.	VACUUM LOOSE FRUIT COLLECTOR.....	2
10.	3 IN 1 COCOA POST-HARVEST MACHINE	6
11.	THE UTILIZATION OF GREEN BANANA (MUSA ACUMINATA X MUSA BALBISIANA) FLOUR IN THE DEVELOPMENT OF KEROPOK LEKOR	9
12.	THE UTILIZATION OF DATE PALM FRUITS POWDER IN THE DEVELOPMENT OF PASTA.....	18
13.	THE UTILIZATION OF JACKFRUIT SEED FLOUR IN THE DEVELOPMENT OF MALAYSIAN FISH CRACKER.....	25
14.	THE USE OF BAMBOO SHOOTS IN THE DEVELOPMENT OF PLANT- BASED PATTIES.....	38
15.	SMART FERMENTATION SHALLOW BOX	44
16.	PHYTOCHEMICAL AND BIOLOGICAL ANALYSIS OF MEDICINAL PLANT, <i>Apium graveolens</i> (CELERY): A REVIEW	48
17.	CALCIUM BIOFORTIFIED SCHIZOPHYLLUM COMMUNE AND ITS RELATION TO STUNTED GROWTH AMONG CHILDREN	51
18.	REAL-TIME TEMPERATURE AND HUMIDITY MONITORING OF STINGLESS BEE COLONIES USING IOT TECHNOLOGY	59
19.	THE ANTIBACTERIAL PROPERTIES OF SCHIZOPHYLLUM COMMUNE AND THEOBROMA CACAO L	63
20.	PALM OIL CARTON PACKAGING	69
21.	SILVER AWARD	73
22.	COCOA SOLAR DRYER.....	74
23.	SUSTAINABLE PLANT WASTE MANAGEMENT (BANANA PEEL POWDERED FERTILIZER)	77
24.	ANANAS COMOSUS SMART SENSOR GRADING	79
25.	FRUIT SANITIZE POSTHARVEST	82
26.	LOOSE FRUITS REMOVER.....	87
27.	PADDY-TECH MACHINES	93

28.	OIL PALM CREAMPUFF	96
29.	BUD-KIT AS A CLASSROOM LEARNING TOOL.....	101
30.	PORTABLE PEPPER COLLECTER	105
31.	SOLAR RICE THRESHER.....	107
32.	THEOBROMA TECHNOLOGY (DRYER).....	113
33.	BRONZE AWARD.....	116
34.	SOLAR SEED DRYER WITH AUTOMATIC TRACKING	117

OIL PALM CREAMPUFF

Muhammad Afif Jazimin Wae Ali Etam¹, Nurnarina Abu Bakar²

¹*Faculty of Agriculture and Technology, Universiti Teknologi MARA (UiTM) Arau, Malaysia*

Corresponding author e-mail: afifjaziminwae@gmail.com

ABSTRACT - The palm oil industry is one of the crucial and critical sectors in Malaysia. It contributes 25.8 percent and 34.3 percent of the world's palm oil production and exports. In 2021, the oil palm sector generated RM108.52 billion in revenue for the exportation and production of palm oil. However, in the plantations, the yield is not harvested thoroughly as the loose fruits of the oil palm are always abandoned. Thus, this project is carried out to testify whether the way chosen to maximise the usage of the oil palm fruitlets to prevent any wastage, especially the loose fruits is suitable to be implied or not. The steps involved in the making of creampufts are extracting the oil palm fruitlets, baking the choux pastry, and filling the pastries with oil palm fruitlets extract cream. The creampufts produced have a fluffy and soft texture. Apart from that, the creampuft also contains polyunsaturated fatty acid (PUFA) and antioxidants that provide benefits to health. It is found that the chosen way is suitable to be implied in preventing any wastage of oil palm fruitlets. Also, a low cost is spent to make the creampuft yet easily obtained an absolute result. In conclusion, the wastage of loose oil palm fruits in plantations can be minimized by turning them into consumable creampufts.

Keywords: Oil palm, fruitlet, creampuft, choux pastry, filling

INTRODUCTION

The oil palm (*Elais guineensis*) originated in West Africa, where it is found in the region between Angola and Gambia [1]. In the 1870s, it is planted as an ornamental plant at the Singapore Botanic Garden. The starting point of phenomenal expansion of the oil palm industry began in 1917 at Tennamaram Estate Selangor, where the first commercial planting of oil palm trees was. Oil palm produces more yield compared to other oil crops including sunflower, soybean, and rapeseed [2]. Malaysia produced about 18 million tonnes of crude palm oil (CPO) in 2021 and generated RM108.52 billion in revenue for the exportation and production of oil palm [3]. Oil palm produces two types of oil, which are CPO, orange-red oil colour that is produced from the mesocarp, and palm kernel oil (PKO), colourless oil which is produced from the seed. Palm oil is mostly used for food purposes, consists of 90 percent of the oil palm usage and the remaining are being used for other purposes, such as biofuel, personal care, and pharmaceutical.

The palm oil itself contains high phenolic compounds such as gallic, ferulic, and chlorogenic acids as well as catechins, hesperidin, and narirutin [4]. Apart from that, Lau et. al [5] found that the presence of bioactive peptides together with antioxidant properties [4] is indicated as one of the key ingredients in a health-promoting food as the peptide helps to lessen the effects of oxidative stress and lipid peroxidation.

One of the indicators for fresh fruit bunch (FFB) is ready to be harvested is the presence of oil palm loose fruits on the ground. The loose fruits or fruitlets are either naturally detached from FFB, remarked that FFB is ripe and ready to be harvested, or scattered during harvesting activity [6]. This also shows that fruitlets have higher oil content compared to FFB. However, the fruitlets are abandoned by plantations and left in the field due to their small size and perception of not worth being collected without knowing the quality of the fruitlets themselves.

The present project is conducted to investigate whether the fruitlets are suitable to be used as one of the ingredients in pastry making with the known beneficial effects to health besides able to prevent the wastage of leftover fruitlets in the field.

MATERIAL AND METHOD

The project is conducted from December 2021 to January 2022. The ingredients used to make cream puff are wheat flour, butter, A-graded eggs, fresh milk, corn starch, vanilla essence, sugar, and oil palm fruitlets extract. Whereas the kitchen utensils and appliances used are a mixer, hand whisk, pan, ladle, spatula, spoons, balance, bowls, blender, and oven.

There are a few similar ingredients used to make the choux pastry and the fillings. The ingredients used to make the choux pastry are 125ml of oil palm fruitlets extract, 100g of butter, 125g of wheat flour, 3 A-graded eggs, and 1 teaspoon of sugar whereas the ingredients for the fillings are a tablespoon of wheat flour, a tablespoon of corn starch, four tablespoons of sugar, 125ml of the oil palm fruitlets extract, a tablespoon of butter, a teaspoon of vanilla essence and an A-graded egg.

Preparation of the Oil Palm Fruitlets Extract

The oil palm was extracted by selecting and cleaning 500g of fresh fruitlets; to prevent the usage of spoilage fruitlets as it may cause food poisoning for those who consume the creampuff. Then, fully dried fruitlets were steamed to soften the shells as they are too hard to be peeled off by hand. Later, the seeds were separated from the husk while peeled fruitlets were put into the blender. Some water was poured into the blender as a lubricant so the blender's blades would have an easier time breaking down the fruitlets easier with aid of any liquid base. The blended fruitlets were then poured into the sieves to filter out the residue of the oil palm fruitlets before putting the filtered extract into plastic bags and kept in the freezer to prolong its shelf life.

Preparation of the Choux Pastry

125ml of the oil palm fruitlets extract and 100g of butter are heated in a pan and cooked until both ingredients are mixed well and then quickly brought to a boil. As the mixture boiled, the heat is turned off and 125g of wheat flour is added. The mixture is stirred quickly to prevent any sticking of the flour at the base of the pan. The mixture is then set aside in another container and left for 5 minutes to reduce the temperature of the mixture.

Next, an egg is cracked into a clean bowl and quickly whisked after a few drops of vanilla essence are added. While whisking the mixture, the remaining two eggs are added one by one to the bowl, and then combined both whisked eggs with the flour mixture in a bowl for preparation of choux pastry batter.

Some butter is spread over the tray to prevent the choux pastry from sticking onto the surface of the tray which may cause defects to the pastries when removing them later. The batter of the choux pastry is poured into a plastic pipe and piped onto the tray with consistent size. The piped batter must be put about two centimeters from one another, to prevent them from combining with each other, as they will expand when being baked. The oven is pre-heated at 180°C for 15 minutes, then the tray of piped choux pastry is put into the oven and baked for 35 minutes. After ensuring all the choux pastries are fully cooked, the pastries are set aside to let them cool down.

Preparation of Filling

The filling is prepared by combining a tablespoon of wheat flour, a tablespoon of cornstarch, and four tablespoons of sugar in a bowl and mixing them well. Two tablespoons of the oil palm fruitlets extract are added into the mixture, and it is stirred until a smooth mixture is created, and it is important to make sure there are no lumps present in the mixture. Then, an egg and some fresh milk were added, and stirred the mixture until well mixed. The mixture is then transferred into a pan and cooked at low heat until it turned into a perfect and smooth cream. The cream is then set aside to let it cool down.

Later, the cream is inserted into a piping bag to be filled into the choux pastries through the hole made beforehand. Filled the choux pastries with enough oil palm cream and make sure the cream is not overflowing from the pastries. The pastries are now ready to be served.

RESULTS AND DISCUSSION

Figure 1 showed the final product of the project that is made after all the procedures have been completed. The cream puff is successfully transported from Alor Setar to Arau by train and the shape is still maintained even after being dropped a few times, yet the cream puff is packed in the basic container only.

The cream puffs were distributed to a few people to get their feedback on the texture and taste of the oil palm cream puff. Most of them are satisfied with the characteristics of the cream puffs as they mentioned they tasted the fluffy and soft texture of choux pastry, and there is a well-balanced taste between choux pastry and the filling. Also, the oil palm cream puff was presented well. The cream puffs are managed to be consumable for five days without keeping them in the chiller. This marked a good achievement as there are no preservatives added to the cream puffs.

The project proved that it is an epitome way to maximise the usage of oil palm fruitlets, especially the loose fruitlets. According to Nu'man et. al [7] and Mohd Ramdhan et. al [6] many of the loose fruitlets detached from the bunch are abandoned although they can produce more oil than the fresh fruit bunch (FFB). This is because it requires more time to collect them thoroughly compared to just collecting the oil palm bunches. Besides producing more amount of palm oil, the uncollected loose fruitlets also can be the food source for the pests in the oil palm plantations. A study conducted by Phua et. al [8] found that there was high rat occurrence in oil palm plantations due to food availability besides a conducive environment for breeding and hiding from predators. Thus, by collecting the loose fruitlets of oil palm thoroughly, the population of the pests that consume the fruitlets can be controlled.

The oil palm fruitlets extract is composed of a near balance of saturated fatty acids to the unsaturated, and rich blend of phenolic compounds known as carotenoids and antioxidants [4,5,9-11]. The studies from these researchers proved that the content of vitamin E, specifically tocopherol- and tocotrienol promotes a reduction in low-density lipoprotein (LDL) as well as regulates the glucose in the blood. Tocotrienol possesses a neuroprotective property for the lipid-soluble vitamin in brain tissue rich in polyunsaturated fatty acids (PUFA). Being one of the final products that can be obtained from the downstream activities of the oil palm, the oil palm cream puff can be the new source of income either the side income for the producer or a source of income for the people. The oil palm fruitlets have a short shelf life, which can last for up to three days after harvesting. Henceforth, by producing the oil palm cream puff it can be the alternative way in reducing any wastage of the potentially spoiled oil palm fruitlets as the cream puffs have a longer shelf life in their fresh condition, let alone when being frozen, where they can last up to three months



Figure 1: Final product of the project (oil palm cream puff)



Figure 2: Ingredients for choux pastry



Figure 3 : Ingredients for the filling



Figure 4 : Peeled off oil palm fruitlets' husk



Figure 5: Baked choux pastries in 180°C for 35 minutes

CONCLUSION

In conclusion, the oil palm creampuff project is one of the alternatives that can be a choice to overcome the wastage of loose oil palm fruitlets as it is an easy project to be done with simple materials and tools. The market for creampuff can be expanded by promoting it online as it may attract the attention of people around the world to invest their time and money in the oil palm creampuff. People also can obtain the benefits of oil palm in the health aspect as the oil palm fruitlets extract contains high antioxidants and PUFA.

REFERENCES

- [1] B. Nambiappan, A. Ismail, N. Hashim, N. Ismail, D.N. Shahari, N.A. Nik Idris, N. Omar, K. Mohamed Salleh, N.A. Mohd Hassan and A. Khushairi. Malaysia: 100 Years of Resilient Palm Oil Economic Performance. *Journal of Oil Palm Research* 30 (1) (2018) 12-25.
- [2] D.J. Murphy. Oil Palm: Future Prospects for Yield and Quality Improvements. 21(11/12) (2009) 257-260.
- [3] G.K. Ahmad Parveez, N.N. Kamil, N.Z. Zawawi, M.O. Abdullah, R. Rasuddin, K.L. Soh, K.R. Selvaduray,
- [4] S.H. Seng and Z. Idris. Oil Palm Economic Performance in Malaysia and R&D Progress in 2021. *Journal of Oil Palm Research*, 34(2) (2022) 185-218.
- [5] N. Balasundram, Y.A. Tan, R. Sambanthamurthi, K. Sundram and S. Samman. Antioxidant properties of palm fruit extracts. *Asia Pac J Clin Nutr* 4(4) (2005) 319-324.
- [6] B.Y.C. Lau, A. Othman and U.S. Ramli. Antifungal and Antioxidant Peptides from Oil Palm Mesocarps.
- [7] *Journal of Oil Palm Research*, 34(3) (2022) 453-464.
- [8] K. Mohd Ramdhan, S. Abd Rahim and K. Norman. Mechanising oil palm loose fruits collection – A review.
- [9] *Journal of Oil Palm Research*, 33(1) (2021) 1-11.
- [10] A.H. Nu'man, M.H. Ng, A.M. Rusnani and C.M. Che Rahmat. The effect of microwave treatment and delayed harvesting on oil palm fruitlets (*Elaeis guineensis*) oil quality. *Journal of Oil Palm Research*, 33(4) (2021) 678-688.
- [11] M.H. Phua, C.W. Chong, A. Abdul Hamid and M.N. Hafidzi. Understanding rat occurrences in oil palm plantation using high-resolution satellite image and GIS data. *Precision Agriculture* 19 (1) (2017).
- [12] D.A. Toyin, A.O. Folorunso and O.O. Oluwafemi. Palm oil: its antioxidant potential in diabeters mellitus.
- [13] *Diabetes Second Edition* (28) 285-291.
- [14] N. Balasundram, Y.A. Tan, R. Sambanthamurthi, K. Sundram and S. Samman. Antioxidant properties of palm fruit extracts. *Asia Pac J Clin Nutr* 4(4) (2005) 319-324.
- [15] F. Abdullah, R. Ismail, R. Guazali and Z. Idris. Total phenolic contents and antioxidant activity of palm oils and palm kernel oils at various refining processes. *Journal of Oil Palm Research* 30(4) (2018) 682-692.

E-EXTENDED ABSTRACT of the INTERNATIONAL AGROTECHNOLOGY INNOVATION SYMPOSIUM
(i-AIS) (4th EDITION)



FAKULTI PERLADANGAN DAN AGROTEKNOLOGI UiTM JASIN

(online)



UNIVERSITI
TEKNOLOGI
MARA

Fakulti
Perladangan dan
Agroteknologi

