ENT600

TECHNOLOGY ENTREPRENEURSHIP

(SEMESTER OCTOBER 2020 – JANUARY 2021)

PROJECT TITLE: LITCIAE FLOUR

GROUP MEMBERS	**ID**
NURUL IZZATI BT MEDIHI	2019325001
NURUL HUSNA RASHIQAH BT RASLI	2019362137
NURUL AFIQAH BT MOHAMMAD NADZREE	2019717909
NUR NAEL 'AWATEEF BT HARUN	2019722927
SITI NUR AISYAH BT MOHAMAD DASHUKI	2019597829
CLASS	AS2466A2

PREPARED FOR: MADAM NABILAH ABDUL SHUKUR

EXECUTIVE SUMMARY

Flour is a key ingredient in many foods including breads, desserts and noodles. It is often used as a thickener in sauces and soups as well. Typically, flour is made from wheat which possesses a good amount of gluten to give texture and elasticity to the foods. Although it is unproblematic for many, people with celiac disease, non-celiac gluten sensitivity or those avoiding gluten for other reasons should not consume the wheat flour. Hence, a variety of gluten-free alternatives to regular wheat flour have been produced. However, the common problems of currently available gluten-free flours are they are expensive and have texture issues such as reduced elasticity and increased cooking losses in pasta.

Therefore in order to tackle these issues, we introduced LitCiae flour. LitCiae flour is technically produced by grinding raw seeds of engkala fruit (*Litsea garciae*). Engkala fruit is a well known native fruit in West Malaysia, Sarawak and Sabah. The fruit is round, pink and has white flesh with creamy texture and flavour that resembles avocado. Like the avocado, the engkala fruit is very nutritious containing high natural antioxidants, protein, vitamins and minerals. Additionally, its raw seed also possesses a good amount of antioxidant and minerals as well as higher protein and fibre content (Hussen, 2015). However, the seeds are usually thrown away as they are inedible. Thus, to make it suitable for consumption, the seeds need to be processed first. In fact, the existence of the LitCiae flour can maximize the utilisation of the fruit and be a solution to food waste especially during in season.

Therefore, the process of making LitCiae flour involves cleaning, washing, cutting, crushing, dewatering, drying and sieving the seeds to produce a fine LitCiae flour. LitCiae flour is a gluten-free flour. Thus, it can be consumed by people with celiac disease, non-celiac gluten sensitivity or those avoiding gluten for other reasons. This flour also can be used to produce pasta with an excellent quality and taste as good as pasta made from semolina flour. We developed an anti-clump technology (GelaTech) where the LitCiae flour will undergo the gelatinization process to avoid clumpiness. The cooking of pre-gelatinized flour will produce a dough with even heat and moisture distribution and clump-free pasta.

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CHAPTER 1

INTRODUCTION

1.1 Problem Statement

LitCiae flour is suitable for celiac disease (CD) and non-celiac gluten sensitivity (NCGV) patients, also it is made from the seed of Engkala fruit. According to Niland and Cash (2018), gluten refers to “a family of prolamins (primarily glutenin and gliadin) that constitute the storage protein in the starchy endosperm of many cereal grains such as wheat, barley, and rye”. CD patients and NCGS patients have to practice a gluten-free diet where any foods containing gluten must be avoided and eliminated from their diet. When gluten is consumed by these patients, they may encounter symptoms such as abdominal pain, bloating, gas, diarrhea, foggy mind, lethargy, or fatigue (Moore, 2020).

The trend of gluten-free diet among non-celiac disease patients also increases as some people perceived gluten-free foods are healthier compared to gluten-containing foods. Besides, they also believe that gluten-free foods are more nutritious, able to reduce body weight and safe for health (Mohd Fauad *et al.,* 2020). With that, LitCiae flour can be used as a substitute for any other types of flour to produce baked goods such as breads, cakes, cookies, muffins, and also can be used as an ingredient to make pastas.

1.2 Objectives

The objectives of this project are:

1. To produce a low-cost gluten-free flour with high nutritional values and health benefits.
2. To minimize food waste as the utilization of Engkala seed into flour is able to reduce the disposal of Engkala seed.