

**A STUDY ON THE ON TOTAL COLOR CHANGES OF FIBER ENRICHED MILK TABLET
AT DIFFERENT STORAGE CONDITION.**

SITI AMIRA UZIR

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FACULTY OF CHEMICAL ENGINEERING & BIOPROCESSING

UNIVERSITI TEKNOLOGI MARA

SHAH ALAM

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ABSTRACT

Malnutrition problems among young children and adult are incredibly serious which include inadequate consumption of fiber and milk which are also rich in nutrients to help body functions. The problems are also extremely severe in less fortunate country. Fruits and vegetables are the main source which offers abundant health benefits to human. Apart from that, this natural source of fiber contains natural pigments which contribute to the attractive color of the food. Hence the breakthrough approach to encourage milk and fiber consumption in young children is by the development of fiber enriched milk tablet. The study focuses on development of fiber enriched milk tablet for ease of transportation, storage and increased shelf life. Without additional synthetic coloring additives, the objectives of the research work are to study the natural color stability of fiber enriched milk tablets upon storage. From the study done, each fiber source chosen contains different natural pigments that responsible for the tablets color. Since different fiber source contains different pigments have different which behaves differently due to their auto oxidation behavior and kinetics which requires deeper studies regarding their degradation mechanism in order to successfully determine optimum storage condition for each fiber enriched milk tablets. Based on the results obtained, every pigment shows significant value of total color changes (ΔE) upon 5 days storage at different storage condition. All pigments shows significant ΔE when subjected to extreme storage temperature, light and metal ions from packaging.

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CHAPTER 1

INTRODUCTION

1.1 Research Background

Malnutrition is a condition that develops when the body does not obtain accurate amount of essential nutrients such as protein, carbohydrate, vitamins and other nutrients to sustain healthy tissues and organs functions. Health problem is surprisingly common within children due to poor eating habit and lack of food sources consumed may be the main reason that leads to malnutrition. Basically, malnutrition occurs in children who are either overnutrition or undernutrition. Children who are overnutrition may become overweight that eventually lead to other serious health problem and social distress due to lack of confidence(Health).Children who are undernourished are usually caused by insufficient dietary intake of carbohydrate, protein and micronutrients that is vital for growth and maintain healthy immune system(Health).Commonly, children who are undernourished usually are deficient in variety of nutrients. These deficiencies will lead to stunted growth, impaired immune system, specific illnesses such as anemia and osteoporosis (Burgess, 2008a). Moreover, undernutrition is also the leading cause of illness and fatalities among women and young children in several developing countries such as Africa (Burgess, 2008b).

Another component that plays crucial role in healthy diet plan is dietary fiber that plays significant role to maintain healthy digestive system and helps to reduce blood glucose level(Szalay, 2014a). Fibers are usually found in numerous amounts in plant based food such as vegetables, fruits and grains. The beneficial effects of eating healthy and balanced meal are widely acknowledged. However from recent studies, many children do not meet the recommended guidelines of nutritional intake which will eventually lead to malnutrition(Zeinstra, Koelen, & Graft, 2007). Moreover, as the children get older they tend to consume less fruits and vegetables and more high fat snacks, sweets and soft drinks. This unhealthy food does not only contain zero nutritional value but usually formulated with excessive amount of chemicals such as sweeteners, flavoring agent and also coloring agents (Zeinstra et al., 2007)

Several studies are being performed to promote healthy diet for young children and teenager by approaching their preference of food. From the studies, children are more likely to attract at food which are sweet, flavored and easy for them to consume. According to a comparison study of plain milk and