

CHAPTER I

INTRODUCTION

1.1 Background

The consumption of milk has been increasing overtime and processed into products such as various types of milk, fermented product, variety and style of cheese, ice cream, frozen yoghurt, frozen desserts, butter, cultured products and many more. One of the examples of fermented product is yogurt, a semisolid product where standardized milk is mixed with symbiotic blend of cultures and fermented. The symbiotic blend of cultures commonly used are *Lactobacillus acidophilus*, *Bifidobacterium* spp., *Lactobacillus reuteri*, *Lactobacillus casei*, *Lactobacillus rhamnosus* GG, *Lactobacillus gasseri* and *Lactobacillus johnsonii* LA1. Yogurt can be produced from various milk such as cow, buffalo, goat, sheep, yak, and other mammals. Yogurt comes in varieties of flavor such as plain fruit flavored, whipped, drinking type, smoke, dried, strained/ Greek and frozen (Chandan and Kilara, 2013)

The popularity consumption of yoghurt has been growing due to its health benefits. The symbiotic of culture include both probiotic and prebiotic where it acts in a synergistic way where the prebiotics supports growth of probiotic and shows positive effect in our body. The health benefit of yoghurt that has been proven includes cancer prevention, reduction in diarrhea associated with travel, antibiotic therapy and rotavirus, improvement of gastrointestinal health, enhancement of

immunity of the host, amelioration of lactose-intolerance symptoms, protection from infection caused by food-borne microorganisms, control of vaginitis and vaccine-adjuvants effects (Chandan and Kilara, 2013).

Mangosteen is called 'Queen of tropical fruits' and referred as 'finest fruit of the world' which known by different names around the world. Mangosteen are sub-globose compose of hard dark brownish on the outside and reddish purple inside of the rind, and white soft flesh surrounding the seed. The fruit, pericarp, twigs and bark have certain functional feature for medicinal properties (Radha and Matthew, 2007). Mangosteen has been proven for its medical benefits where it called 'Fruit of the Gods' and on top it tastes delicious. The health benefits of mangosteen is it helps in preventing and stopping wide ranges of diseases such as diabetes, heart disease, Alzheimer's disease, cancer and other chronic diseases. The use of mangosteen has been used over centuries in Southeast Asians to maintain and regain the health and cure some diseases such as infection, inflammation, and increasing energy (Hunter, 2014).

Pericarp of mangosteen have been used ever since by Chinese and Ayurvedic medicine. People in South Asia used the pericarp as antiseptic, anti-inflammatory, anti-parasitic, antipyretic, analgesic and treatment for skin rashes (Shibata *et al.*, 2013). It contains about forty or more biologically active natural chemical compounds called Xanthones, where it has similar molecular structure but has different chemical composition with different specific function (Hunter, 2014).

The addition of pericarp of mangosteen into yogurt is to produce product with health benefits. Yogurt is proved to lower the number of malonaldehyde in

human blood thereby it can slow down peroxide process. Peroxide process happened due to free radical where it breaks down long chain of fatty acid in the cell to lipid hydroperoxide (Watson and Preedy, 2015). Thereby the addition of the mangosteen pericarp expected to help to increase the antioxidant content as functional properties in the application in food.

1.2 Research Problem

Mangosteen pericarp is a waste product from mangosteen with constituent about 60% of the fruit. The reddish purple pericarp contains anthocyanin, color source of the pericarp that can be used as natural coloring agent source in food product. Pericarp of mangosteen has been proven to have many health benefit for human body thereby it has been used over the centuries to treat sickness in many countries e.g. South Asia (Shibata, Matoba, Tosa, & Linuma, 2013) but utilization of it has not been really applied in food due to its undesirable flavor such as bitterness and astringency. Mangosteen pericarp might be utilized by adding to yogurt. Yogurt is fermented product prepared from milk fermented by bacteria which has benefit upon consumption. Thereby, by utilizing mangosteen pericarp it is expected to improve functionality of fermented products, for example, it may increase the activity of antioxidant of yogurt. Furthermore, there has been very little studies regarding utilization of mangosteen pericarp applied to yogurt.

1.3 Objectives

1.3.3 General Objectives

The general objective of this research is to study the chemical, physical and sensory attribute of yogurt added with mangosteen pericarp juice and extract.

1.3.2 Specific Objectives

The specific objectives of this research are:

1. To determine effect of different blanching method on the antioxidant characteristics on mangosteen pericarp juice, and selecting the best method of blanching.
2. To determine effect of treated mangosteen pericarp juice and extract with selected blanching method added to yogurt with different milk ratio towards the antioxidant characteristics, and selecting the best yogurt based on the antioxidant activity.