

CHAPTER 1

INTRODUCTION

1.1. Background

Nowadays the trend of plant based food is increasing, and more products are made using ingredients such as fresh produce such as unripe jackfruit, mushrooms, etc. The fresh produce is used as it is highly accessible, affordable, has meat-like texture, or high in protein. However, the plant-based meat products that are made out of fresh produce are more likely to differ greatly as the characteristics of the fresh produce are not the same. Also it is more likely to undergo changes or deterioration in a shorter period due to improper handling during harvesting, uncontrolled environment, higher moisture content or microbial load. To maintain the product quality and safety, a standard must be developed to determine the characteristics of the plant based product and the end-point of the product quality or the shelf life as there are still no clear standards from the government about the product quality, especially in Indonesia. Shelf life is the time period under defined storage conditions where the food remains acceptable for human consumption in terms of safety, nutritional content, and eating quality (Corradini, 2018). The end of the shelf life is defined as the condition where one or more quality factors become non-acceptable.

One of the plant-based meat products made out of local ingredients which are used in this study are plant-based meatballs that are developed by Meatless Kingdom. The meatballs are made using unripe jackfruit, oyster mushrooms, texturized soy protein, and other ingredients that act as binders and texturizers. The product has around 10% of carbohydrate, 21% of protein, and 4% of fat. The product is packed in vacuum packaging and stored in frozen conditions where it is supposed to last for 10 months. There are several aspects that affect the plant-based meatball such as high moisture content, high water activity, and microorganisms from either raw materials or contamination from the

environment during processing of the product. The microorganisms that are present in the product can either be seen on the product itself (i.e. mold), or even bacteria that may lead the product to physicochemical changes. Therefore it is important to analyze the product changes during storage periods to determine the criterion for the end point of plant-based meat product to ensure the quality and safety of the products before being distributed or consumed by the consumers. However, as the product is stored in frozen conditions, the changes during storage might take a long time, thus the product characteristic changes are also analyzed when it is stored in room temperature that represents temperature during shipping is used.

Cooking processes also would affect the quality of the product, especially texture due to the high starch content and product characteristics which tends to absorb water. Thus it would be important to ensure that the product is still acceptable by the consumers after the cooking processes as uncooked and cooked products may have differences in quality factors and acceptance.

1.2. Problem Formulation

Based on the research background, the problems can be formulated as :

1. What quality changes occurred during the storage of plant based meatballs stored in frozen conditions and room temperature?
2. Are there any differences in uncooked and cooked meatball samples?

1.3. Objectives

The objectives of this study are :

1. to assess the quality changes of plant-based meatball during storage in frozen conditions and room temperature
2. to compare the characteristics of uncooked and cooked samples

1.4. Scope of study

The research will focus on the quality assurance field and the scope of work in this research covers (1) the analysis of physicochemical aspects such as texture, water activity, pH, and moisture, (2) microbiological spoilage for total bacteria and yeast mold of uncooked and cooked samples that are stored in both frozen storages for 11 weeks and in room temperature for 4 days period, (3) comparing the characteristics of uncooked and cooked samples, (4) determine the aspects that can indicate the shelf life of the meatball.