BIOPOM FILM

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1.0 EXECUTIVE SUMMARY

Fruit is one of the perishable foods with a limited shelf life after being harvested. The delay before they become inedible or unmarketable is influenced by the fruit itself and several environmental factors. The storage temperature, pressure, and relative humidity, as well as the composition of the surrounding gas, are all aspects of environmental factors that need to be considered (Mercier et al., 2019). On the other hand, there is a constantly growing rate of food waste worldwide, of which the most abundant waste is represented by fruit by-products, with a percentage of the residues around 40–50% of the total discards. According to the Food and Agriculture Organisation (FAO) analysis, 1.3 billion of food are wasted annually, and the management of the waste has become a major issue for governments due to the high costs of disposal and treatment (Dilucia et., 2020). To solve this issue, municipalities have decided to simply transport the wastes to landfills and incinerate them, resulting in the reduction of land availability and environmental pollution.

Therefore, the development of BioPom film in Malaysia is an innovative initiative in catering to the issues that have been mentioned previously. BioPom film is a product made from pomegranate (*Punica granatum*) fruit waste able to inhibit the growth of bacteria, retard the oxidation process, prolong fruit shelf life, and at the same time will reduce the abandoned food residue. Pomegranate has been chosen as the main ingredient for film manufacturing due to its high phenolic content, which gives the films a good antioxidant characteristic. In addition, the strong free radical and antibacterial properties of pomegranate peel extract sparked interest in this by-product, thus leading to the development of active films (Dilucia et., 2020). BioPom film can protect the fruits that easily deteriorate after being sliced or harvested, such as apple, banana, avocado, grape and orange, to maintain their freshness.

Generally, the production of BioPom film is done by drying and grinding the pomegranate residue like seed, peel, and pomace, collected from the pomegranate juice and jam industry into powder. BioPom film is a biodegradable product that can be decomposed by living organisms; as a result, this innovation can lead to the reduction of environmental pollution. We developed a BacBeGone technology (BBGTech) where the BioPom film contained high antibacterial and antioxidant activity, which does not only prevent bacteria

growth and slows down the oxidation process but also gives better mechanical properties like improving the tensile strength and water vapour barrier, which increased film solubility.

The productive, systematic, and efficient management is achieved by having administrative, financial, operation, and marketing department. Each departments play a major role in ensuring the successfulness of the incorporation of BioPom film into the market. BioPom film is available in three different sizes which is small, medium, and large. The price ranges in between RM 11 and RM 15 depending on the sizes. The predicted net profit for the first year and the second year is RM 44 000 and RM 65 000 respectively.