CHAPTER 1

INTRODUCTION

1.1 PROJECT BACKGROUND

Shrimps are like lobster and crab but with smaller and weaker legs, it is categorized as arthropods. Arthropods are living things that have their skeleton on the outside of the body and is called exoskeleton which gives shrimps their unique look. There are thousands of total shrimp species worldwide, they can be found in saltwater, freshwater, brackish water, or combination of habitats. Researchers often use different ways to categorize shrimps, for example warm-water shrimp of tropical waters from south, and cold-water shrimp from north where the water are colder.

Approximately thirty percent (30%) of consumed seafood in U.S. are shrimps which can be explain by about 4-5 pounds out of 14-15 pounds of total seafood consumed per year come from shrimp. While average amounts of tuna and salmon are consumed in about 2-3 pounds a year which makes them fall to second place. Shrimp are captured, processed, market, and cooked in many different ways which includes frozen, breaded, fresh, dried, cooked, and in the form of paste. Therefore, in the market, we will find shrimps that are processed into different categories which is with vein, without vein, peeled, unpeeled, and with head or without head.

The terms "shrimp" and "prawns" are confusing. Larger shrimps are called "prawns" where its habitats are mostly from freshwater, while smaller shrimp are called "shrimp" where its habitats are mostly from saltwater. As for size, shrimps are often measured with per kilogram where large shrimps will get about 40 or less per kilogram compared to 50 or less for medium size shrimp and 60 or less for small. But from the view of science, shrimps and prawns can both come from either freshwater or saltwater,
and there are no specified method for measuring the size of a shrimp into small, medium, or large categories.

There is always one question most people would ask about, which is how shrimp sizes are categorised as jumbo, large, medium, and small. But there is no standard method used for measuring shrimp size, number of shrimps per kilogram method is mostly being used to measure the size of shrimps. For small shrimps it is usually measured around 60 shrimps per kilogram. While for medium shrimp, it reduced to about 50 shrimps per kilogram because the shrimp is bigger, and with more weights. Large shrimp will be measuring around 40 shrimps per kilogram. As for super-size jumbo shrimp the measurement is about 30 shrimps per kilogram.

Shrimp has become more and more favourable among all of us for its crunchy bite and its rich nutrients. Shrimp contains carotenoid nutrient astaxanthin which provides antioxidant support to nervous systems and musculoskeletal system. Studies shows that astaxanthin can helps reduce the risk of colon cancer and also some diabetes related problems.

Besides, shrimps also contain mineral such as selenium which helps glutathione peroxidase (GPO) to function properly, GPO is a type of enzyme that cannot function without selenium. GPO is an enzyme that protects most of our human body systems such as lungs from damage caused by small particles in air. Research shows that the selenium found in shrimp can be absorb efficiently by human body which is 80-85% of total intake of selenium. The lack of selenium mineral in human body may also cause cardiovascular disease such as heart failure along with other problems which includes type 2 diabetes, depression, and cognitive function.

On the other hand, copper-zinc is also found in shrimp and is also classified as antioxidant mineral. In our body, copper-zinc is required to help the functions of copper-zinc superoxide dismutase (SOD), which is a type of enzyme. SOD is located in most fluid compartment of our cells which is cytosol, it helps regulating oxygen metabolism and also preventing oxidative stress.

Recent researchers have proven some useful side of the fatty acids found in shrimps. Omega-3 is one of the fatty acid found in shrimps. In omega-3, there are DHA (docosahexaenoic acid) and EPA (eicosapentaenoic acid) which is very important to our nervous and cardiovascular system. At the same time, the ratio of omega-6:omega-3 in shrimps are very unique with around 1:1 ratio. This high ratio of omega-6 and omega-3
will help to reduce the risk of many chronic diseases such as obesity, diabetes, and high blood pressure. In addition, according to recent studies, there are other sterol found in shrimp beside cholestrol, it is a type of fat which can be found in the form of clionasterol and campesterol in small amounts. It is similar to cholesterol chemically and function as anti-inflammatory molecules and are useful is decreasing the level of LDL-cholesterol. Therefore, it can be considered as a health benefit diet.

![Shrimp, large, steamed](image)

**Figure 1.0:** This chart illustrate the percentage of Daily Value (DV) nutrients in each shrimp serving.

**Source:** WHFoods (2013)

In Selinsing District Perak Malaysia, a company named Hannan Food Sdn Bhd was established in 2009 where the main business of this company is shrimp aquaculture. The company has set up an aquaculture complex with 150 vannamei shrimp culture ponds. Until today, the company has started its operation with thirty ponds and will increase more in the future. The raw shrimps in Hannan Food Sdn Bhd is processed and categorized manually by man power using HACCP (Hazard Analysis and Critical Control Point) standard where food safety is the main focus through the analysis and control of food from beginning till the final product.