

CHAPTER II

LITERATURE REVIEW

2.1 Red Beans



Figure 2. 1 Red Beans

Red beans (*Phaseolus vulgaris L.*) are a type of legume that is often found and used in Indonesia. In Indragiri Hillier Regency, red beans are easy to find in the market. In 2014, red bean production in Indonesia reached 100,319 tons (BPS, 2016). Red beans have excellent nutritional content, this is very beneficial for the health of the human body, especially if they are processed properly and correctly. Dried red beans are a source of vegetable protein, complex carbohydrates, Fiber, vitamin B, folacin, thiamine, calcium, phosphorus and iron (Astawan, 2009 in Huda, 2015).

Red Beans contain B vitamins, especially folic acid and vitamin B1, calcium, phosphorus, iron and protein, as well as a source of Fiber. Every 100 grams of boiled dried red beans can provide 19% and 21% of the protein adequacy rate for men and women 20-45 years old. It is also a source of Fiber, which consists of a mixture of soluble and insoluble Fiber. Soluble Fiber is useful for lowering cholesterol and blood sugar concentrations (Afriansyah, 2007; E-Prosea)

2.2 Pine Nuts



Figure 2. 2 Pine Nuts

Pinus pinea L., a major tree nut species known as stone pine, is an evergreen conifer and the largest producer of commercial pine nuts. It is endemic to the Mediterranean Basin, where the seeds have been part of the Mediterranean diet for over 20 centuries. This diet is well recognized as a dietary pattern that reduces some metabolic syndrome risk factors (Estruch et al., 2006; Rees et al., 2014; Ros, Citation2015). In fact, in the last decade, the demand for pine nuts has risen due to the growing evidence of the association of tree nuts consumption to a wide range of health benefits (Estruch et al.; Jenkins et al., 2011; Rees et al., 2014; Sabaté & Ang, 2009).

Pine nuts are edible seeds harvested from pinecones (family *Pinaceae*, genus *Pinus*) commonly used in cuisines worldwide. Although generally referred to as nuts, they are in fact classified as seeds with the edible part (the embryo) surrounded by a hard shell. While unshelled pine nuts have a long shelf life if kept dry, shelled nuts deteriorate rapidly and are susceptible to rancidity. Pine nuts have been harvested for human consumption since prehistoric times (Awan and Pettenella, 2017).

Pine nuts differ from a high content of protein, unsaturated fatty acids and dietary fibre, low-molecular carbohydrates, vitamins (folic acid, niacin, tocopherol, B6 and B2), minerals, phytosterols and polyphenols.