

CHAPTER II

LITERATURE REVIEW

2.1 Strawberry

Strawberry is a nutrient-dense fruit that have a potential in health benefits and also numerous applications in the food industry. It has a sweet taste, high nutritional value, and bright red color which was obtained from the plant that are also called strawberry. Strawberry is a fruit that belongs to the Rosaceae family (Myers, 2021). With its one of a kind flavor and succulent texture, strawberry has earned its title as the “queen of the fruits”. Due to its richness of nutrients such as vitamins C, K, and B6, as well as antioxidant, and fiber, strawberry can contribute to the health benefits such as improve heart health and reduced inflammation. In addition, strawberries have a potential role in improving cognitive function and reducing the risk of neurological disease which was called as “Alzheimer’s disease”. Strawberry has also been explored by professional as it effectiveness in skin. It was used in skincare and wound healing due to its anti-inflammatory and antioxidant properties. The content of antioxidant activities and bioactive compounds in strawberry can also affected by factors such as environmental conditions, stage of maturity, and post-harvest handling. Additionally, the nutritional value and the health benefits of strawberries may vary depending on the variety and the growing condition of the strawberry.

Strawberry, which scientifically known as *Fragaria Vesca* are characterized by their red color, shiny appearance, and the small green leaves on top (Reichert & Madail, 2003). Strawberry is typically heart-shaped which was covered with small yellow or white edible seeds all over their surface which doesn’t affect it taste or quality. Those small, yellow seeds are called achenes, which contained the actual strawberry seeds. Due to its sweetness, juicy texture, and attractive aroma, strawberries are usually consumed in large

quantities. Strawberries are highly valued in the food industry especially in making desserts and confectionery. Strawberry can also be consumed as fresh fruits or others such as jams, juices, smoothies, pies, ice creams. Strawberries are multifunctional and wholesome fruit relished by individuals from various cultures and generation globally.

2.2 Red Spinach

Red Spinach or scientifically known as *Amarantus tricolor* L. is a leafy vegetable that belongs to the family of Amaranthaceae (Jahan *et al.*, 2022). It has leaves that are generally larger and elongated than traditional spinach leaves. It has a deep green or purple-red color with prominent red veins running through the leaves and petioles. Its leaves are spade-shaped with round-point tips and have a red maroon colored stem. In their young stage, red spinach leaves contribute a delicate and subtly sweet, earthy taste with a crispy texture when used raw. As the mature leaves, the flavor become more robust and earthy, with a green, mineral-like taste. When cooked red spinach turns to fades to a more muted green with red veins remains visible.

Red spinach is known as Chinese spinach which was a highly nutritious plant that are rich in vitamins, mineral, antioxidant, as well as bioactive compounds like flavonoids, saponins, and carotenoid. Red spinach is rich in essentials vitamins and mineral that support various bodily function which contains vitamin K that promotes faster wound healing, vitamin A which helps maintaining healthy organs, and vitamin C which strengthens immune system and reduce inflammation (Llc. N, 2022). It also contains calcium and phosphorus for building strong bones and teeth, magnesium for regulating nerve and muscle function, and iron for developing the protein hemoglobin for transporting the oxygen through the bloodstream. The presence of antioxidants and anti-inflammatory properties in red spinach helps protect cells against damaged that are caused by free radicals, making it a highly valued food.

2.3 Unsweetened Applesauce

Unsweetened applesauce is a type of applesauce that doesn't contain any added sugar or sweeteners. It is made by cooking apples without the addition of any sweeteners or flavorings. Unsweetened Applesauce is a low-fat source of vitamin which contain sugar that occur naturally in the fruit. Applesauce contains some carbohydrate and sugar but it is low in fat, salt, and calories. Applesauce contains antioxidant called phytochemicals which may help to reduce the risk of cancer, diabetes, and heart disease. Applesauce generally contains the same amount of soluble fiber as whole apple which helps to lower blood cholesterol levels. Since applesauce is made from fresh apple, it also contained polyphenols which help to reduce blood pressure that resulted in lower cholesterol and blood pressure levels that help to reduce the risk of heart disease, heat attack, and stroke (Mikstas *et al.*, 2022). Due to the beneficial nutrients contained in unsweetened applesauce, it contributes to a healthy diet and also helps to reduce the risk of chronic disease. Unsweetened applesauce is a healthy and nutritious serving of fruit which are low in sugar and free of artificial colors and flavors which is healthy and nutritious low in sugar and free of artificial colors and flavors (Synder, 2020).

2.4 Cereal

Cereal is a grass yielding starchy seeds that comes from a family of Poaceae which is suitable for food (Britannica, 2023). Cereal food is processed grains that are known as popular ready-to-eat breakfast that was consumed globally. Cereals are classified as whole grains and are categorized into two group which are large-seed cereal, which grown in fields or water paddies, and small grain millets. Cereals are made up of three parts which are bran, endosperm, and germ (Bouchard *et al.*, 2022). The bran is the outermost layer that contains fiber and vitamins. The endosperm is the second layer which is a starch-filled layers. And lastly, the germ is the third layer that is rich in vitamin E, phosphorus, and magnesium. Cereals are the most important source of human nutrition which are rich in carbohydrates,

vitamins, proteins, minerals, and dietary fibers (Laskowski *et al.*, 2019). Eating cereal provides energy for the body and it can also be an essential part of a healthy diet. Cereal grains are processed into a variety of food product such as breakfast cereal, baked goods like bread and pastries, and snack foods like crackers and chips. Cereal grains are made into a variety of cereal including cereal loops, cereal flakes, and puffed grains. It was often fortified with additional vitamins and minerals to increase their nutritional value. The whole grain cereals can also reduce the risk of chronic disease, including heart disease, type 2 diabetes, and certain cancer (Huang *et al.*, 2015). This is caused by the high fiber content that helps to regulate blood sugar levels and reduce cholesterol levels.