

I. BACKGROUND, PROBLEM & OPPORTUNITIES

I.1. Background

The outbreak of Covid-19 raises the awareness of our own health. Whereas, awareness of one's own health must have been nurtured even before the outbreak. Good health can be maintained through a balanced diet. In the Balanced Nutrition Guidelines Indonesia, by United Nations' Food and Agriculture Organization [FAO] (2014) based on the “ A Plate Guide”, illustrates the recommended amount of food type to be consumed each time. It stated that a balanced diet must eat a variety of foods, plenty of vegetables and fruits, high-protein foods and limit the consumption of sugar, salt and oil intake according to the guidelines (FAO, 2014).

There are two nutrients, macronutrients and micronutrients. The macronutrients are the nutrients that are needed in large amounts, such as carbohydrates, proteins and fats. While micronutrients consist of water soluble and fat soluble vitamins and minerals. Among all the important minerals needed by the body, calcium keeps on persisting as a shortfall nutrient (Heaney. 2013). The recommended daily intake for calcium for adults aged 19-50 is 1.000 milligrams per day (United States' National Institute of Health, n.d.)

Calcium is easily and commonly found in dairy products such as milk, cheese, yoghurt and other dairy products. Whereas there was a terrifying fact behind the production of cow milk. Most female cows are forced into labor, with the intention to obtain the milk to the maximum amount. This was a harsh cycle of pregnancy. Until a time where the female cows are unable to produce the milk again, they are forced onto trucks and will be transported for slaughter. Many died during the way and if they survived along the way, they would be slaughtered eventually by a shot in the head, hung up with only one leg tied, or also their tongue were slit and then skinned (PETA Australia, n.d.)

I.2. Problem

According to the 2004 Surgeon General's Report on Bone Health and Osteoporosis, it was stated that calcium was pointed out as a major public health issue today as it is critically important to bone health (Heaney, 2013). Commonly,

cow milk is the easiest source of calcium that we could find. According to the Food and Agriculture Organization of the United Nations (2019), cow milk production is the biggest in the world with approximately 81% (p. 181). About 6 billion people worldwide consume milk and of which the majority are those in developing countries (FAO, n.d.).

However, in Asian countries, about 64 percent of the population are reported to have lactose intolerance (Christian, et al., 2017). Moreover, according to The World Population Review (n.d.), approximately more than 250 million Indonesians suffer from lactose intolerance. Lactose intolerance is the inability of someone to digest lactose, commonly found in dairy products. This inability is caused by the insufficiency of an enzyme called lactase.

As those who suffer from lactose intolerance would have a reduction of calcium intake because of milk intake reduction. According to the Food and Agriculture Organization of the United Nations (FAO, 2001), the recommended intake of calcium for male and female adults is 1000mg per day. Unless the shortage of milk intake is replaced by non-dairy sources, insufficient calcium intake may reduce bone density (Honkaken, et al., 2017, as cited in Heaney 2013).

I.3. Solution

In order to avoid the risk, an alternative milk intake for those who have lactose intolerance, is a non-dairy milk. Non-dairy milk is usually made from nuts like almonds, hazelnuts and many others. Almond milk is the most common amongst other plant-based milk that can be found in Indonesia. However, hazelnut milk is rare to be found in supermarkets in Indonesia, even in main cities like Jakarta.

Most hazelnut drinks that can be found in stores are usually syrup-based. The latin name of hazelnut is *Corylus Avellana*. Whereas, Turkey is the largest producer of hazelnut in the world (Islam, 2018). Hazelnuts themselves contain a good amount of calcium. Below is the table for the amount of calcium found in cow's milk and hazelnut milk (Hodges, et al., 2019)

Table I.3.1 Number of Calcium in Cow and Hazelnut Milk

Type of Milk	Mg Ca/100gr
Cow's Milk	113
Hazelnut Milk	114

Source: Hodges, et al., 2019

Based on the table above, the amount of calcium found in hazelnut milk is identical. Other than a good amount of calcium, hazelnut has several benefits that are beneficial for the body. When comparing almond and hazelnut, it was found that hazelnut contains higher monounsaturated fatty acids and fiber. Below is the table for the amount of MUFAs and fiber in almond and hazelnut (National Agricultural Library, n.d., as cited in Ros, 2010)

Table I.3.2 Amount of MUFAs and Fiber in Almond and Hazelnut Milk

Type of Nut	Monosaturated Fatty Acids (gr)	Fiber (gr)
Almond	32.2	8.8
Hazelnut	45.7	10.4

Source: National Agricultural Library, n.d., as cited in Ros, 2010

Hazelnuts are rich in monounsaturated fatty acids (MUFAs). Whereas, MUFAs are known to be able to lower the possibility of heart disease and may have a precaution against atherosclerosis. Whereas, fiber is known to reduce the risk of the evolvement of heart disease, diabetes and constipation (Harvard School of Public Health, n.d.)

Also, the intake of hazelnut helps to prevent peroxidation reactions. Peroxidation reactions can cause several inflammatory and ischemic diseases, AIDS, emphysema, organ transplantation risks, ulcers, hypertension, brain diseases, cancer, smoking-related health issues due to the presence of antioxidant compounds (Essa, et al., 2014).

Other than that, because of the rich content of MUFAs, this nutrient is beneficial for brain health. Since hazelnuts contain unsaturated fats, they are known to be important for developing brain tissues. The amount of antioxidants found in

Hazelnuts are highly beneficial for the brain to resist oxidative stress (Essa, et al., 2014).

