

Chapter 1

Introduction

1.1 Background

Dietary fat plays an important role in healthy growth and development throughout the life cycle. Fat is one of the major dietary sources of energy; provides 30-40% of total dietary energy. Dietary fats are required for a range of physiological and metabolic processes. Fat is an important component for maintaining the structural and functional integrity of all cell membranes. Additionally, the excess fat consumption will be stored in the body as adipose tissue (Skeaff & Mann, 2012).

Dietary fats are classified into several types, fatty acids, phospholipids, sterols, and other constituents of dietary fat (Skeaff & Mann, 2012). Based on types of saturation, dietary fats can be classified into saturated fats and unsaturated fats. The unsaturated fats are further classified into monounsaturated fats and polyunsaturated fats. Saturated fats are generally considered to be bad for health, while most unsaturated fats are good for health. Fats are also classified based on the length of a carbon chain, short-, medium-, and long-chain fatty acids. Meanwhile, based on whether the body can produce fats, fatty acids can be classified into essential and non-essential fatty acids (Griffin & Cunnane, 2009).

Polyunsaturated fatty acids (PUFAs), omega-3 and omega-6 fatty acids which are referred as “healthy fats”, have received a considerable amount of attention because of their positive effects, especially in the children’s nutrition. In regards to the children’s nutrition, excessive fat intake is one of nutritional problem occurred in children, in which leads to health outcomes such as overweight or obesity. In 2016, the Global Health Observatory (GHO) data showed that there were 41 million children under-five years of age overweight. In Africa, there was an increasing number (48%) of overweight children under-five since 2000. Meanwhile, in Indonesia, result from National Basic Health Survey (*Riskesdas*, 2013) found that almost 12% of Indonesian children overweight. A nationally representative survey

found that Indonesian children tend to consume excessive saturated fat, called “bad fat”, rather than consume PUFAs, called “healthy fats” (Neufingerl, *et al.*, 2016).

Due to the fact, nowadays, people are often concerned about the quality (type) of fat children consumed, not solely on the amount of fat consumed. Children ages 3 – 5 years, often referred to as preschoolers, need an adequate intake of omega-3 and omega-6 fatty acids. It is because omega-3 and omega-6 fatty acids are known to play an essential role in the growth and development of children, particularly brain health. They are critical for maintaining the structural and functional integrity of the central nervous system (Singh, 2005). Also, the remaining 10% of brain growth occurs during preschool years. Then, most of the brain growth is completed by 5 – 6 years (Clandinin *et al.*, 1980). It was reported that PUFAs, particularly omega-3, affect child’s learning and behavior. Based on a study, a low level of omega-3 intake was associated with poor cognitive performance and behavior in healthy children (Montgomery *et al.*, 2013). Consequently, omega-3 and omega-6 fatty acids should be provided to children during the preschool-age period.

Furthermore, the children’s intakes of omega-3 and omega-6 fatty acids, which are included in the PUFAs, are below the recommendations. In compare with FAO/WHO recommendations, there were 84% and 31% of Indonesian children have inadequate intake of omega-3 and omega-6 fatty acids respectively. Meanwhile, according to local recommended dietary allowance (RDA) or known as *Angka Kecukupan Gizi (AKG)* (2013), the recommended intake of omega-3 and omega-6 for children aged 1 – 3 and 4 – 6 years are 0.7 and 0.9 g/day for omega-3 and 7.0 and 10.0 g/day for omega-6 respectively. Unfortunately, the median intakes of omega-3 and omega-6 fatty acids of Indonesian children were just 0.245 and 3.953 g/day respectively. Those intakes are below the recommended intake level of Indonesia’s RDA.

Additionally, the good sources of omega-3 fatty acids are mainly found in oils of fish, green leafy vegetables, nuts, and some vegetable oils such as flaxseed or linseed oil,

rapeseed or canola oil. Meanwhile, the rich dietary sources of omega-6 fatty acids are found meat, poultry, egg, and vegetable oils like safflower oil, sunflower oil, olive oil, and palm oil (Simopoulos, 2009; Patterson *et al.*, 2012)

There is a need to have information about the intake of children and what are the food sources. Therefore, the objective of this present study is to assess the intake of omega-3 and omega-6 fatty acids, particularly in preschool-age children, as well as to investigate children's main dietary sources of omega-3 and omega-6 fatty acids.

1.2 Objectives

- To assess omega-3 and omega-6 fatty acid intakes in preschool children.
- To investigate the main dietary sources of omega-3 and omega-6 fatty acid intakes in preschool children.

1.3 Benefits of the study

The findings of the study would provide benefits to:

- The body of knowledge
 - This study gives information about the omega-3 and omega-6 fatty acid intake in Indonesian children, as well as their main dietary sources of omega-3 and omega-6 fatty acids.
- The research
 - Since the study of omega-3 and omega-6 fatty acids intake is rarely discussed in Indonesia, this finding could be used for supplementary literature for further research.
 - This study could be continued for certain purposes and even developed.
- The society
 - This finding can help people to find out the omega-3 and omega-6-rich foods.
 - This finding will help people to know the roles of omega-3 and omega-6 fatty acids in health.