EFFECTS OF FATTY ACIDS AT DIFFERENT POSITIONS IN THE TRIGLYCERIDES ON CHOLESTEROL LEVELS

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ABSTRACT

Previous studies established a series of regression equations for predicting the risk factor effects from serum cholesterol concentrations. However, the degree of saturation was solely based on total fatty acid composition in triglycerides. Our article is focused on the relationships between the published human nutrition studies and predicted values of serum cholesterol levels based on total fatty acid compositions and at sn-2 position in triglycerides. Twenty-two published human nutrition studies were chosen to assess the effects of palm olein, olive oil, cocoa butter, sunflower seed oil, corn oil, soyabean oil, grapeseed oil, groundnut oil and rice bran oil diets on serum cholesterol levels. There were no statistically significant differences between the predicted values of serum cholesterol levels based on fatty acids at sn-2 position and the published human nutrition studies as proven by the statistical analyses with \( p \) values more than 0.05. In contrast, there were statistically significant differences between the predicted values of serum cholesterol levels based on total fatty acids and the published human nutritional studies with \( p \) values less than 0.05. Fatty acids at sn-2 position appear to influence the cholesterol levels rather than total fatty acids of the triglyceride.

Keywords: fatty acid compositions, sn-2 position, serum cholesterol concentrations, experimental value, predicted value.

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INTRODUCTION

Saturated fatty acids are often perceived to be associated with increased risk of heart-related diseases. The American Heart Association's Nutrition Committee suggested a reduction of daily saturated fats intake for adults due to the assumption that saturated fats elevate serum cholesterol levels and consequently increase the risk of coronary heart diseases (CHD) (American Heart Association, 1990). In contrast, it was reported by Reiser (1973) that cocoa butter, a highly saturated fat (approximately 64.2% saturated) has neutral effects on serum cholesterol level in human subjects. For the case of palm olein, it is often categorised as a saturated fat as it contains approximately 47.2% of saturated fatty acid, 52.8% of unsaturated fatty acid (Wahid et al., 2011; Omar et al., 2015) (Table 1) which has fatty acid composition similar to lard. However, based on the available studies in human (Choudhury et al., 1995; Voon et al., 2011; Ng et al., 1992; Tholstrup et al., 2011), palm olein does not elevate blood cholesterol levels as compared to mono-unsaturated oils.