

The Functional Benefit of Coffee for Being Healthy and Beautiful

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Abstract

A healthy and beautiful body is a necessity for everyone. Coffee is a very popular beverage worldwide. Many of the world's people who love coffee but only some people who understand that coffee is able to provide health effects and beauty for the body. The advancement of science in terms of nanomedicine and nanotechnology will provide additional benefits so that coffee as a nanoparticle will increasingly provide wider health benefits for individuals with obesity and individuals without obesity/normal weight. The more modern lifestyles that food consumption shifts to fast food, less fiber or less consumption of vegetables and fruits, lack of exercise, lack of sleep and smoking, air pollution causes high levels of oxidative stress through internal and external factors of the body.

Oxidation stress is a condition of tissue oxidation imbalance due to oxygen molecular excess or ROS/Reactive Oxygen Species.

Keywords: Nanomedicine; Nanotechnology; Nanoparticle

The Role of ROS as Degenerative Disease Promotor

ROS is formed through endogenous processes and exogenous processes. Examples of the exogenous process of ROS formation are ultraviolet radiation and ionizing radiation [1-3]. Example Endogenous process as the originator of ROS form all body metabolism activity related to work of mitochondrial electron transport chain, work of cytochrome P450 system, activity of NADPH oxidase and enzyme myeloperoxidase and xanthin oxidase [2,3]. Increased ROS is excessive will result in oxidative stress resulting in the destruction of cellular macromolecules. Nucleic acid, proteins and lipids are some of the damage to cellular macromolecules [4,5]. Oxidation is easy to do on cell membranes because cell membranes contain unsaturated fatty acids. Oxidation of lipids there are 2, namely primary and secondary lipid oxidation. Primary lipid oxidation results in LOOH or lipid hydroperoxidation [6] which has the potential to oxidize [7] to form cytotoxic and genotoxic compounds [8,9]. Secondary lipid oxidation will produce LPO or lipid peroxidation products then produce radicals free so that degenerative diseases that will cause coronary heart disease, stroke and the problem of aging (Figure 1) [6].

Stress Oxidative

The role of free fatty acid as degenerative disease promotor

The nerve and hormonal complex will regulate the balance between the storage of triglycerides and lipolysis. Triglycerides themselves are energy substrates. Triglycerides can be used when triglycerides in adipose tissue have turned into fatty acids (these changes are called hydrolyzed). Changes of triglycerides into fatty acids assisted by hormone sensitive lipase. The fatty acids formed from triglyceride changes in adipose tissue, will exit from the adipose tissue to the blood circulation and are present in the blood plasma for 3-4 minutes. At rest, the fatty acid exits the adipose tissue faster than fatty acid oxidation [10]. Excessive fatty acids in the blood plasma will facilitate the work of fatty acids as an oxidizing energy substrate when responding to sudden changes in energy requirements. For example during sports activities, there is often a sudden increase in energy demand. However, not all fatty acids are oxidized so that the fatty acid must re-esterify triglycerides in adipose tissue, muscle and liver. Fatty acids become the main precursor of triglyceride synthesis of VLDL/Very Low Density in liver [11,12].

The role and benefit of coffee as degenerative disease preventif

Coffee contains several main components such as phenolic acid [13] and caffeine [14]. It also contains vitamin P and caffeic acid. The function of caffeine stimulates catecholamines and adrenaline, then results in weight loss and prevent obesity risk (antiobesity). Caffeine ultimately inhibit lipid peroxidation and the occurrence of atherosclerosis (antioxidant). Effects of caffeine on obesity are to participate in splitting triacylglycerol into free fatty acids and glycerol. In addition, the benefit of caffeine also inhibits NFkB then inhibit COX2 or inhibit the role of pro-inflammatory so that the complaints such as pain in the joints due to obesity will decrease by itself after consuming coffee (anti-inflammatory). Caffeic acid itself serves as an immunomodulator through its role in inhibiting NFkB. Vitamin P from coffee is an antioxidant that has a role in inhibiting ROS resulting in inhibition of endothel dysfunction and ultimately to prevent the incidence of atherosclerosis. Chlorogenic acid's coffee will inhibits hyperuricemia by inhibiting excessive production of uric acid (antihyperuricemia). Actually uric acid is an endogenous antioxidant. In the condition of obesity is often accompanied by the occurrence of hyperglycemia resulting in oxygenation of LDL and eventually arise lipid peroxidation and atherosclerosis. But with coffee consumption, coffee drinking which contains chlorogenic acid eventually the incidence of hyperglycemia in a person with obesity will be inhibited, as well as the incidence of hyperuricemia and will no risk endothel dysfunction. Endothel dysfunction will cause atherosclerosis (Figure 2) [15].

In addition to functional benefits for the health of the body, coffee beans are still mudapun have benefits to health/beauty because of the macro and micronutrient content that affect the occurrence of lipolysis in the body. Several studies conducted on mice [16] showed

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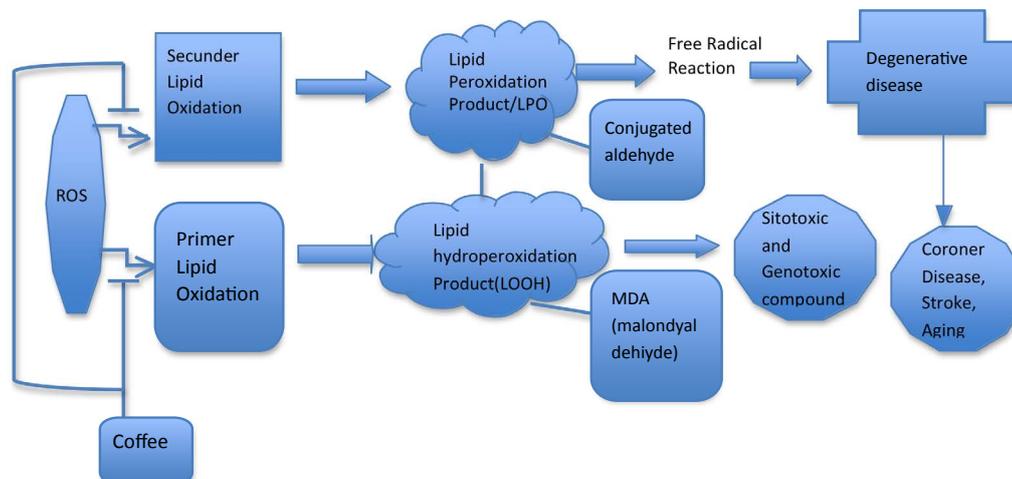
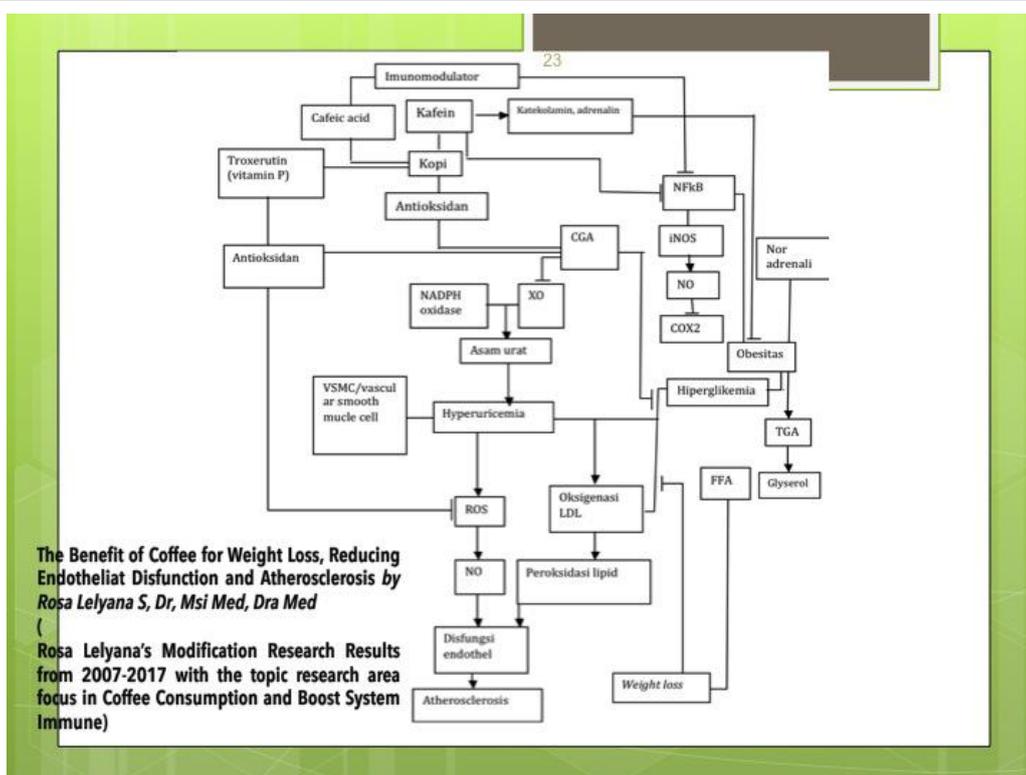


Figure 1: Secunder and primer lipid oxidation product as a good marker for stress oxidative.



The Benefit of Coffee for Weight Loss, Reducing Endothelial Dysfunction and Atherosclerosis by Rosa Lelyana S, Dr, Msi Med, Dra Med
(Rosa Lelyana's Modification Research Results from 2007-2017 with the topic research area focus in Coffee Consumption and Boost System Immune)

Figure 2: The functional of coffee which has antioxidant activity from Rosa Lelyana's modification of coffee and obesity results study from 2008-2012 and the benefit of coffee for hyperuricemia, endothel dysfunction and weight loss by Lelyana [13].

that young coffee beans can inhibit fat metabolism in the liver. Study of consumption of extracted young coffee beans was carried out on mouse-fed animals for at least 6 days, 13 days and 14 days. The study was conducted with various doses of young coffee bean extraction thus providing a beneficial effect inhibiting fat metabolism [16].

Coffee can be used as a cosmetic [17]. Ground coffee contains 15% coffee oil, of which 75% contains triacylglycerol, while some contain free fatty acids, waxes, sterols, tocopherol, ceramide, diterpenes and phosphatides [18]. Coffee oil has a content of linoleic acid and

palmitic acid that is useful for skin inflammation and skin aging. It also has the ability to stimulate the formation of collagen, elastin and glycosaminoglican up to 2-fold, as well as protection against UV rays or as Sun Protection Factor (SPF), reduce TEWL (trans epidermal water loss) so that body skin will be more beautiful and healthy [18].

So, coffee has various health benefits for the body predominantly when consumed every day and enough only 2 cups of coffee a day [14,19].

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