oxidation

4/20/2024

608-238-6001 [TEL]

greg@cruisingreview.com [Email]

Cruising Review

This webpage QR code

Oxidation: Publications and Research from SwissMixIt

Structured Data

<script type= "application/ld+json">
{"@context":"http://schema.org",
"@graph":[
{
"@type" : "Organization",
"@id" : "https://cruisingreview.com/#organization",
"name" : "Cruising Review",
"url" : "https://cruisingreview.com",
"sameAs":
["https://www.youtube.com/channel/UC7gOvLwcxt8MtYt3ExzAZJQ",
"https://www.instagram.com/pepe.g6"],
"telephone" : "608-238-6001",
"email" : "greg@cruisingreview.com",
"logo" : "https://cruisingreview.com/logo.png"
},
{
"@type":"WebSite",
"@id":"https://cruisingreview.com",
"url":"https://cruisingreview.com",
"name":"Oxidation: Publications and Research from SwissMixIt ",
"description":"Fatty acid B oxidation is a major source of energy in the mitochondria; ultimately generating the reducing agents flavin adenine dinucleotide (FADH2) and nicotinamide adenine dinucleotide (NADH+) to serve as electron donors to the respiratory chain for oxidative phosphorylation and ATP generation. Lipids are the substrate largely responsible for energy supply during submaximal exercise. Lipids as a fuel source for energy supply during submaximal exercise originate from subcutaneous adipose tissue derived fatty acids (FA), intramuscular triacylglycerides (IMTG), cholesterol and dietary fat."
}
,{
"@type":"NewsArticle",
"mainEntityOfPage":{
"@type":"WebPage",
"@id":"https://cruisingreview.com/smx/oxidation.html"},
"headline":"Oxidation: Publications and Research from SwissMixIt ",
"image":"https://cruisingreview.com/images/",
"datePublished":"2024-04-20T08:00:00+08:00",
"dateModified":"2024-04-20T09:20:00+08:00",
"author":{
"@type":"Organization",
"name":"Cruising Review",
"url":"https://cruisingreview.com"
},
"publisher":{
"@type":"Organization",
"name":"Cruising Review",
"logo":{
"@type":"ImageObject",
"url":"https://cruisingreview.com/logo.png"
}}}

]}</script>

Fatty acid B oxidation is a major source of energy in the mitochondria; ultimately generating the reducing agents flavin adenine dinucleotide (FADH2) and nicotinamide adenine dinucleotide (NADH+) to serve as electron donors to the respiratory chain for oxidative phosphorylation and ATP generation. Lipids are the substrate largely responsible for energy supply during submaximal exercise. Lipids as a fuel source for energy supply during submaximal exercise originate from subcutaneous adipose tissue derived fatty acids (FA), intramuscular triacylglycerides (IMTG), cholesterol and dietary fat.

PDF Version of the webpage (first pages)

https://cruisingreview.com/smx/oxidation.html

Oxidation Botanical Information

Fatty acid B oxidation is a major source of energy in the mitochondria; ultimately generating the reducing agents flavin adenine dinucleotide (FADH2) and nicotinamide adenine dinucleotide (NADH+) to serve as electron donors to the respiratory chain for oxidative phosphorylation and ATP generation. Lipids are the substrate largely responsible for energy supply during submaximal exercise. Lipids as a fuel source for energy supply during submaximal exercise originate from subcutaneous adipose tissue derived fatty acids (FA), intramuscular triacylglycerides (IMTG), cholesterol and dietary fat. Fatty acid oxidation disorders (FAODs), mitochondrial β-oxidation, hypoketotic hypoglycemia, carnitine, trifunctional protein, Fat oxidation, Substrate oxidation, Dietary fat oxidation, Crossover concept, Maximal fat oxidation, PDH activity, Fat adaptation, Ketogenic diet, Cpt-1, Carnitine, oxidative deterioration, hydroperoxide, volatile compounds, aldehydes, thiobarbituric acid reactive substances (TBARs), analytical methods, free radicals, Aging, Antioxidants, Phenolic compounds, Skin aging, pro-oxidant, reducing power, cyclic voltammetry, oxidative damage markers

Keywords: Fatty acid oxidation disorders (FAODs), mitochondrial β-oxidation, hypoketotic hypoglycemia, carnitine, trifunctional protein, Fat oxidation, Substrate oxidation, Dietary fat oxidation, Crossover concept, Maximal fat oxidation, PDH activity, Fat adaptation, Ketogenic diet, Cpt-1, Carnitine, oxidative deterioration, hydroperoxide, volatile compounds, aldehydes, thiobarbituric acid reactive substances (TBARs), analytical methods, free radicals, Aging, Antioxidants, Phenolic compounds, Skin aging, pro-oxidant, reducing power, cyclic voltammetry, oxidative damage markers
Description and Research Abstract: Fatty acid β-oxidation is a major source of energy in the mitochondria; ultimately generating the reducing agents flavin adenine dinucleotide (FADH2) and nicotinamide adenine dinucleotide (NADH+) to serve as electron donors to the respiratory chain for oxidative phosphorylation and ATP generation.

Lipids are the substrate largely responsible for energy supply during submaximal exercise. Lipids as a fuel source for energy supply during submaximal exercise originate from subcutaneous adipose tissue derived fatty acids (FA), intramuscular triacylglycerides (IMTG), cholesterol and dietary fat. These sources of fat contribute to fatty acid oxidation (FAox) in various ways. The regulation and utilization of FAs in a maximal capacity occur primarily at exercise intensities between 45 and 65 percent VO2max, is known as maximal fat oxidation (MFO), and is measured in g/min. Fatty acid oxidation occurs during submaximal exercise intensities, but is also complimentary to carbohydrate oxidation (CHOox). Due to limitations within FA transport across the cell and mitochondrial membranes, FAox is limited at higher exercise intensities. The point at which FAox reaches maximum and begins to decline is referred to as the crossover point. Exercise intensities that exceed the crossover point (65 Percent VO2max) utilize CHO as the predominant fuel source for energy supply.

Meat constituents are susceptible to degradation processes. Among them, the most important, after microbial deterioration, are oxidative processes, which affect lipids, pigments, proteins and vitamins. During these reactions a sensory degradation of the product occurs, causing consumer rejection. In addition, there is a nutritional loss that leads to the formation of toxic substances, so the control of oxidative processes is of vital importance for the meat industry.

Free radicals are unstable chemical species, highly reactive, being formed by cellular entities of different tissues. Increased production of these species without proper effective action of endogenous and exogenous antioxidant systems, generates a condition of oxidative stress, potentially provider of skin disorders that extend from functional impairments (skin cancer, dermatitis, chronic and acute inflammatory processes) even aesthetic character, with the destruction of structural proteins and cellular changes with the appearance of stains, marks and lines of expressions and other signs inherent to the intrinsic and extrinsic skin aging process.

Oxidative stress refers to the imbalance between free radicals and their stabilizing agent's antioxidant enzymes in the body. Reactive oxygen species or free radicals can be produced by normal cellular metabolism and react with biomolecules like protein, lipid, and DNA to cause cellular damage and responsible for degenerative changes.

Oxidative stress is closely related to all aspects of cancer, from carcino- genesis to the tumor-bearing state, from treatment to prevention. The human body is constantly under oxidative stress arising from exogenous origins (e.g., ultraviolet rays) and endogenous origins (at the cellular level where mitochondria are involved). When such oxidative stress exceeds the capacity of the oxidation-reduction system of the body, gene mutations may result or intracellular signal transduction and transcription factors may be affected directly or via antioxidants, leading to carcino- genesis.

Lipid oxidation is a major cause of deterioration in the quality of food and food products. Oxidation can occur in both triglycerides and phospholipids of food because lipids are divided into two main classes; polar lipids (phospholipids) and neutral lipids (triglycerides). Lipid oxidation has been long been recognized as a major problem in the storage of fatty acids in foods.

Cancer cells exhibit increased reactive oxygen species (ROS) generation that may promote cell proliferation. Many phytochemicals have been implicated in combating oxidative stress-induced diseases such as cancer and other chronic disorders. Many of these phytochemicals have the power to inhibit cell proliferation and also to suppress the promotion and progression of cancer. Phytochemicals like flavonoids inhibit the oxidative enzymes such as 5-lipoxygenase and 12-lipoxygenase. Terpenoids, another class of phytochemicals, suppress tumor growth by inhibiting HMG-CoA reductase activity.

Many cosmetics that are marketed nowadays often contain antioxidants as the active ingredients. It is known that oxidation reactions could produce free radicals, which can start chain reactions that will damage skin cells. Increasing the amount of free radicals could initiate the wrinkling, photoaging, elastosis, drying, and pigmentation of the skin. Topical antioxidants could terminate the chain reactions by removing the free radical intermediates and inhibit other oxidation reactions by being oxidized themselves; this could defend the skin against the environmental stress caused by free radicals. It is well known that plants can produce natural antioxidant compounds that could control the oxidative stress caused by sunlight and oxygen. The cosmetic formulations usually contain various combinations of many plant extracts, for example, green tea, rosemary, grape seed, basil grape, blueberry, tomato, acerola seed, pine bark, and milk thistle. These plants extracts contain natural antioxidants, that is, polyphenols, flavonoids, flavanols, stilbens, and terpenes (including carotenoids and essential oils).

Topical vitamin C has a wide range of clinical applications, from antiaging and antipigmentary to photoprotective. Currently, clinical studies on the efficacy of topical formulations of vitamin C remain limited, and the challenge lies in finding the most stable and permeable formulation in achieving the optimal results.

Topical application of vitamin C has an established history of use in skincare. A large body of literature from clinical and laboratory studies supports a scientific basis for its use in improving both the appearance and health of the skin.

Enzyme Browning is a usual phenomenon that can be observed commonly in fruits and vegetables, which results in quality loss of the food including the change in colour, taste, flavor and nutritional value. This occurs when the phenolic compounds present in them react with Polyphenol oxidase (type III copper enzyme). The phenolic compounds are oxidized to their quinone derivatives and further oxidized to form melanin pigment, found in living beings, is responsible for the browning reaction.

Oxidative stress is caused by imbalance between oxidants and antioxidants. Reactive Oxygen Species (ROS) not only cause cell damage, but are also involved in intracellular signaling. ROS include superoxide (O2-), hydrogen peroxide (H2O2), hydroxyl radical (OH-) and peroxynitrite.

Oxidative stress occurs when the balance between reactive oxygen species (ROS) formation and detoxification favors an increase in ROS levels, leading to disturbed cellular function. ROS causes damage to cellular macromolecules causing lipid peroxidation, nucleic acid, and protein alterations. Their formation is considered as a pathobiochemical mechanism involved in the initiation or progression phase of various diseases such as atherosclerosis, ischemic heart diseases, diabetes, and initiation of carcinogenesis or liver diseases.

Oxidative stress is well known to be involved in the pathogenesis of lifestyle-related diseases, including atherosclerosis, hypertension, diabetes mellitus, ischemic diseases, and malignancies.

Oxidative stress has been defined as harmful because oxygen free radicals attack biological molecules such as lipids, pro- teins, and DNA. However, oxidative stress also has a useful role in physiologic adaptation and in the regulation of intracellular signal transduction.

Reactive oxygen species (ROS) and other radicals are involved in a variety of biological phenomena, such as mutation, carcinogenesis, degenerative and other diseases, inflammation, aging, and development. ROS are well recognized for playing a dual role as deleterious and beneficial species.

4/20/2024