Canadian Academy of Sports Nutrition

Let's Excel Together

Lecture 36:

Antioxidants

Part 2

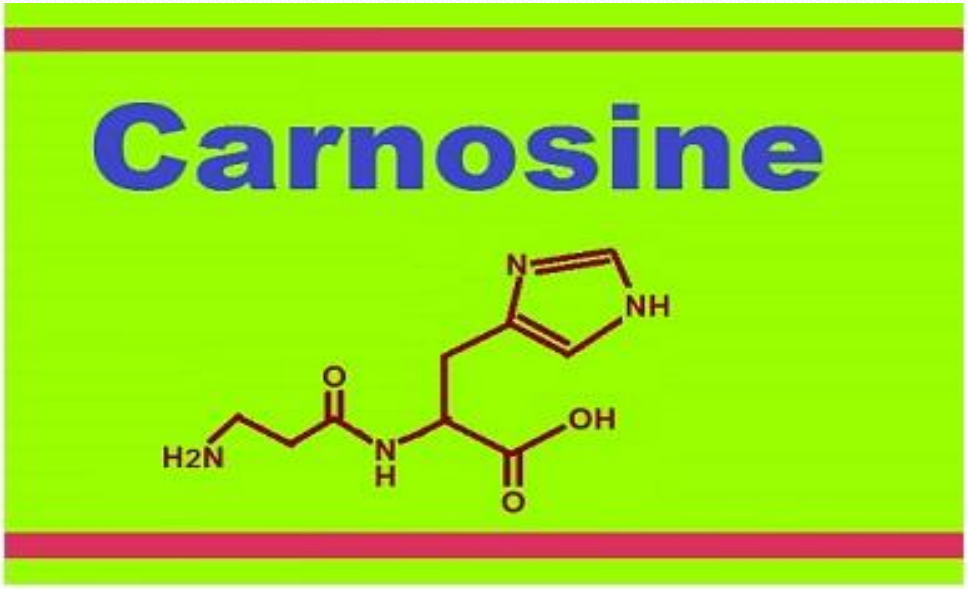
Copyright Protection:

The antioxidants that will be discussed in this lecture are:

- **Carnosine**
- **Lycopene**
- **Curcumin**
- **Glutathione**
- **Quercetin**

Carnosine:

- **Carnosine is a dipeptide composed of the amino acids alanine and histidine.**



- **It shows antioxidant activity especially on the brain.**
- **Normally, carnosine is mainly found in the skeletal muscles, brain, and heart.**
- **Beef and chicken are good sources of carnosine.**

Athletic Benefits of Carnosine:

Potential benefits of Carnosine in athletes are:

- **1) buffering hydrogen ion, making the body alkaline.**
- **2) increasing output of the working muscles.**
- **3) improving endurance .**
- **4) improving recovery from intense exercise.**

Non- Athletic Benefits of Carnosine:

Carnosine may be beneficial in the following conditions:

- **a) Diabetic nephropathy.**
- **b) Peptic ulcer (zinc – carnosine complex).**
- **c) H. Pylori infection (zinc – carnosine complex).**
- **d) Chronic hepatitis C (zinc – carnosine complex).**
- **e) Wound healing.**
- **f) Autism.**
- **g) Severe gingivitis caused by chemotherapy (zinc – carnosine complex).**

Dosage:

- **As an antioxidant, carnosine can be used 1000 – 1500 mg a day.**

- **As a buffering agent: 30 mg/kg/day about 60 – 90 minutes before exercise.**

Lycopene:

- **Lycopene is a carotenoid that has a strong antioxidant property.**
- **Lycopene has no vitamin A activity.**
- **Lycopene is found in gac (a fruit with the highest amount), tomatoes, watermelon, pink grapefruit, pink guava, papaya, asparagus, basil, and parsley.**

Benefits of Lycopene:

Lycopene is beneficial in the following conditions:

- **a) Exercise – induced asthma.**
- **b) Prostate cancer.**
- **c) Preeclampsia (pregnancy – induced hypertension).**
- **d) Prevention of atherosclerosis.**
- **e) Macular degeneration of the eyes.**
- **f) Male infertility due to low sperm count and motility.**

- **g) Adrenal exhaustion.**
- **h) Prevention against the cancers of the cervix, breast, lung, stomach, esophagus, liver, and colon.**

Dosage:

- **Lycopene is taken 10 – 30 mg daily.**

Curcumin:

- **Curcumin is the active ingredient in the spice turmeric and a potent scavenger of free radicals.**

Potential Benefits of Curcumin:

- **a) Liver detoxification (curcumin inhibits phase I, but stimulates phase II of the liver detoxification). It also improves gallbladder function and bile flow.**

- **b) As a strong anti-inflammatory agent in RA (rheumatoid arthritis), OA (osteoarthritis), inflammatory bowel diseases (IBD), bursitis, tendinitis, and sprains and strains.**

- **c) Anti – cancer activity by promoting apoptosis (programmed cell death) in unhealthy cells.**
- **d) May help slow down progression of Alzheimer's disease and other dementias.**
- **e) Helps maintain cognitive function.**
- **f) Eases indigestion.**
- **g) As a topical agent in genital herpes.**

- **h) Supports immune function in HIV/AIDS.**
- **i) Promotes cardiovascular health by preventing atherosclerosis.**
- **j) Is helpful in psoriasis.**

Dosage:

- Curcumin is taken 500 – 1500 mg per day.
- It is not recommended in people with diagnosed gallstones.
- People with iron deficiency anemia should exercise caution when taking curcumin, as it may chelate iron.
- It may lower nitric oxide (NO) level, which could affect negatively athletic performance.

Glutathione:

- **Glutathione is one of the TOP three primary antioxidants in the body.**

- **The other two are:**

- Catalase .

- Superoxide dismutase (SOD).

- **It is a sulfur – containing compound made of the three amino acids cysteine, glutamic acid, and glycine.**

- **The body needs vitamin B2, vitamin B6 and selenium to produce glutathione.**

Natural Sources:

- **Glutathione is found in fish, egg whites, walnuts, whey protein, asparagus, and avocado.**

- **Cinnamon, turmeric, and cardamom can increase glutathione level.**

What increase glutathione level?

- N – acetyl cysteine (NAC).
- Alpha-lipoic acid (ALA).
- S – adenosyl methionine (SAMe).
- Melatonin.
- Milk thistle.
- Glutamine.
- Methionine.

What decrease glutathione level?

- Regular consumption of acetaminophen.
- Smoking.

Benefits of Glutathione:

The Following Conditions May Benefit from Glutathione:

- a) Liver detoxification. The toxins styrene, polystyrene, methyl bromide, methylglyoxal, and methylene chloride (used as a coffee-decaffeinating agent) are detoxified by glutathione.
- b) Acetaminophen overdose or toxicity.
- c) Athletic overtraining syndrome.
- d) Prevention of colon cancer.

- **e) Lung disorders, such as cystic fibrosis, asthma, and idiopathic pulmonary fibrosis (IPF), chronic obstructive pulmonary disease (COPD), as it may help improve lung function.**
- **f) HIV/AIDS.**
- **g) Neurodegenerative diseases, such as Alzheimer`s disease and Parkinson`s disease. Glutathione is one of the main antioxidants in the brain.**
- **h) Male infertility due to low sperm count.**
- **i) Chronic rhinitis.**
- **j) Cataracts.**

Dosage:

- **Glutathione is available in capsule and tablet, sublingual, and injectable forms.**
- **As a tablet or capsule: 100 – 500 mg daily.**
- **As injection: 200 mg per one millilitre of solution and is used intramuscularly or subcutaneously.**
- **Sublingual forms are in 50 mg and can be used up to 3 pills a day.**

Quercetin:

- **Quercetin is a flavonoid that has antioxidant, anti-inflammatory, and anti-histamine activities.**

- **It is also considered a phytoestrogen.**

Natural Sources:

- **The richest source of quercetin is caper berries. Other sources are onions, dill, kale, buckwheat, cranberry, watercress, black plums, apples, sweet potatoes, sea buckthorn, chokeberry, and prickly pear.**

Caper berries are the best food sources of quercetin.
Image: Copyright©Depositphotos.com/Malgorzata Kistryn

Benefits of Quercetin:

The conditions that may benefit from quercetin are:

- **Prostatitis (non-bacterial).**
- **Allergies.**
- **Asthma.**
- **Diabetes type II (quercetin has an anti-diabetic effect by enhancing insulin production).**
- **Hay fever.**
- **HIV/AIDS (quercetin demonstrates activity against HIV).**

- **Hepatitis.**
- **Metabolic syndrome.**
- **Fibromyalgia.**
- **Gout.**
- **Hypertension.**
- **Eye disorders: cataracts and retinopathy.**
- **Varicose veins.**
- **Depression (not on medications).**
- **Parkinson`s disease (not on medications).**
- **Edema and water retention.**
- **It may improve athletic endurance.**

Dosage:

- **Quercetin is usually taken 1000 – 1500 mg per day.**

- **It has a synergistic effect with vitamin C and bromelain.**

Interactions:

- Quercetin is contraindicated in people who take the antibiotics fluoroquinolones and the chemotherapeutic agent paclitaxel.

- It may also alter metabolism of serotonin and melatonin by inhibiting the enzyme monoamine oxidase (MAO), which is responsible for breaking them down.

- People with depression and Parkinson's disease who take medications should exercise caution when taking quercetin.

Homework:

- **1) Describe how curcumin functions.**
- **2) List athletic and non - athletic benefits of carnosine.**