Let's Excel Together

CANADIAN ACADEMY OF SPORTS NUTRITION

Lecture 40:

Weight Loss Aids

Part 2

Copyright Protection:

II) Macronutrients Modulators:

1) Insulin Mimickers:

- Alpha – Lipoic Acid (ALA).
- Banaba Extract.
- Chromium Picolinate
- Vanadium.

2) Fat Blockers:

- Chitosan.

3) Fat Carriers:

- L – Carnitine.

4) Lipotropic Agents:

- Betaine (Trimethylglycine).
- Betaine hydrochloride
- Choline (Vitamin B18).
- Inositol (Vitamin B8).
- Methionine.

Inositol (Vitamin B8):

- **Inositol is a member of vitamin B group and closely related to choline. It is sometimes called "vitamin Bm", as it is actually myo – inositol.**

- **Acting as a lipotropic agent, inositol accelerates the breakdown of fats, prevents abnormal or excessive accumulation of fat, and increases their utilization by the body.**

- **It also helps with the metabolism of fatty acids and carbohydrates.**

Functions of Inositol:

- a) It is required for the integrity of the cell membrane.
- b) It assists the metabolism of fatty acids and carbohydrates.
- c) It may help with the conduction of nerve signals.
- d) It has a lipotropic activity.
- e) It may control calcium concentration within the cells.
- f) It is necessary for optimal function of insulin.

Food Sources:

- **Inositol is a part of phospholipid in animals and phytic acid in plants.**

- **Food sources of inositol include brewer`s yeast, liver, whole grains, cantaloupe, citrus fruits (except lemon), bananas, wheat germ, nuts, beans, raisins, cabbage, and lecithin.**

- **Also the body can produce inositol from glucose by intestinal bacteria.**

Absorption:

- **Inositol is primarily absorbed from the small intestine and distributed in all body tissues, with the highest concentrations in the brain, heart, and lens of the eyes.**

- **After vitamin B3, inositol has the second highest store in the body.**

- **Caffeine depletes the inositol stores from the body, leading to potential inositol deficiency.**

Benefits of Inositol:

- The following conditions may benefit from inositol:
- a) Anxiety.
- b) Depression.
- c) Bipolar disorder.
- d) Panic disorder.
- e) Premature ejaculation.
- f) Obsessive - compulsive disorder (OCD).
- g) Bulimia.
- h) Diabetes.
- i) Fatty liver.

- j) Multiple sclerosis.
- k) Diabetic neuropathy.
- l) Polycystic ovarian syndrome (PCOS).
- m) High cholesterol.
- n) Hair loss.
- o) Dermatitis.
- p) Eczema.
- q) Intermittent claudication.
- r) Raynaud`s disease.
- s) Restless leg syndrome.
- t) Metabolic syndrome.
- u) Weight management.

Dosage and Side Effects:

- **No RDA has been established for inositol.**
- **It is added in small amount to many multivitamin products.**
- **The usual suggested dose is 1000 – 4000 mg a day. However, for psychiatric disorders such as anxiety, depression, and obsessive – compulsive disorder, more than 10 grams a day might be needed.**

- **Although inositol is considered safe, larger amounts could cause stomach upset, nausea, and belches**

Interactions:

- a) Lithium: inositol may increase the effectiveness of this medication.

- b) Inositol nicotinate breaks down into niacin in the body. Therefore, inositol products increase blood levels of niacin.

Choline (Vitamin B18):

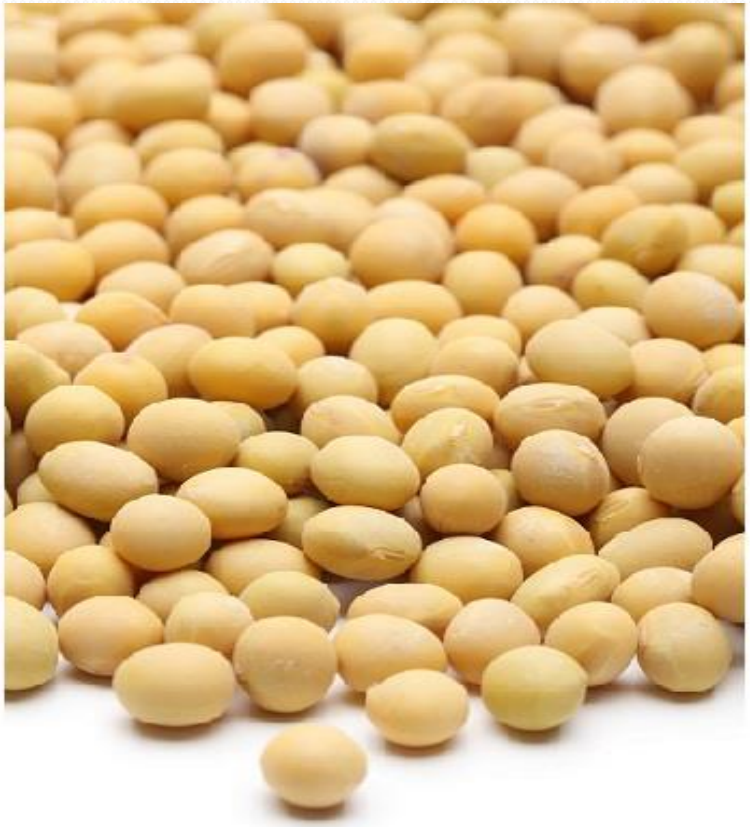
- **Choline is a water soluble nutrient and a new member of the vitamin B family.**
- **We, at the Canadian Academy of Sports Nutrition, have named choline as the "vitamin B18" for the first time.**
- **Choline is a "lipotropic agent" and "conditionally essential" nutrient in that de novo synthesis occurs in the liver.**

Functions of Choline:

- **a) It is a precursor for acetylcholine, phospholipids, and betaine.**
- **b) It is required for the metabolism of fat and cholesterol.**
- **c) It helps with utilization of fats in the body (lipotropic).**
- **d) It has an important role in detoxification system.**
- **e) It is vital for the myelin sheaths of the nerves and normal function of the liver and gallbladder.**

Food Sources:

- **The highest amount of choline is found in phosphatidylcholine (lecithin), which is usually extracted from soybeans.**



Soybeans are excellent sources of lecithin from which choline is extracted.

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- **Other food sources are brewer`s yeast, wheat germ, egg yolk, organ meats, flaxseeds, sesame seeds, and peanuts. Small amounts can be found in potatoes, lentils, cauliflowers, and oats.**

- **This vitamin is manufactured by the liver as well.**

Absorption:

- **Choline is absorbed well from the small intestine.**

- **It can easily cross the blood – brain barrier into the spinal fluid and brain wherein is used to produce the neurotransmitter acetylcholine.**

Athletic Benefits of Choline:

Heavy exercise and intense training lower the levels of choline in the body.

As a sport ergogenic aid, choline may demonstrate the following athletic benefits:

- **a) It may improve exercise recovery.**
- **b) It may enhance mental acuity.**
- **c) It may increase endurance performance.**
- **d) It may prevent from post – exercise muscle damage (rhobdomyolysis).**
- **e) It may diminish exercise – induced fatigue.**

Non – Athletic Benefits of Choline:

Choline may be beneficial in the following conditions:

- **a) Fatty liver.**
- **b) Liver cirrhosis.**
- **c) High cholesterol levels.**
- **d) High homocysteine levels.**
- **e) Alzheimer's disease.**
- **f) Dementias.**
- **g) Tardive dyskinesia.**

- h) Asthma.
- i) Prevention of neural tube defects.
- j) Multiple sclerosis.
- k) Parkinson`s disease.
- l) Bipolar disorder.
- m) Glaucoma.
- n) Tinnitus.
- o) Hypoglycemia.

Choline Deficiency:

Choline deficiency results in a wide range of health concerns, such as:

- **fatty liver.**
- **elevated liver enzymes.**
- **skeletal muscle damage with elevated levels of creatine phosphokinase.**
- **fatigue.**

- **It has been also linked to insomnia, high levels of homocysteine, and heart diseases.**

Dosage:

The recommended adequate intakes of choline:

- **Men: 550 mg per day.**
- **Women: 425 mg per day.**
- **Athletes : 600 – 1200 mg a day.**

- **The upper limit for choline has been set at 3500 mg a day.**
- **Choline is available either as 250 mg, 500 mg, and 1000 mg and usually combined with inositol (vitamin B8) or as lecithin at 1200 mg. One pill of lecithin provides about 50 mg of choline.**

Side Effects:

- Larger doses of choline may cause stomach upset, nausea, vomiting, diarrhea, sweating, and fishy body odor (due to breakdown of choline to trimethylamine in the GI tract).

- People with fish odor syndrome (trimethylaminuria) should avoid taking choline supplements.

Homework:

- 1) Describe the functions of vitamin B8.
- 2) Describe how vitamin B18 could benefit athletes.