



Lecture 41:

Weight Loss Aids

Part 3

Copyright Protection:

- This lecture note is owned by the “Canadian Academy of Sports Nutrition” and all rights are reserved and protected by copyright and trademark laws, international conventions, and all other laws relating to the protection of intellectual property and proprietary rights.
- No part of the content of this lecture note may be reproduced, stored in retrieval system, or transmitted by any means, electronic, mechanical, photocopying, recording, or otherwise, without written permission from the Canadian Academy of Sports Nutrition. Unauthorized use, display or distribution of any part of the content of this lecture note is deemed copyright infringement.

III) Thermogenesis Inducers:

Thermogenesis inducers are:

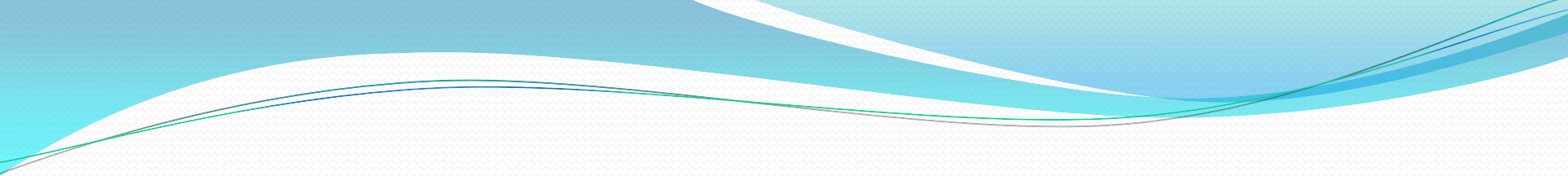
- Caffeine.
- Citrus Aurantium.
- Guarana.
- Ma Huang (Ephedra).

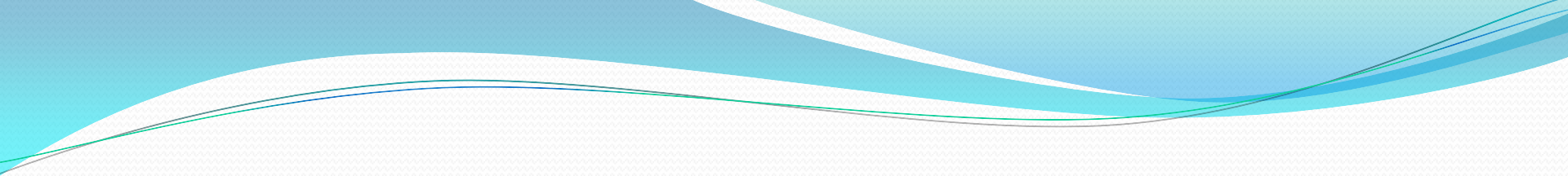


Citrus Aurantium:

- Also known as **bitter orange**, and **Seville orange**.
- It is a member of citrus trees and its fruits and leaves have been used for medicinal and athletic purposes.



- 
- The peels of bitter orange contain **synephrine, octopamine, tyramine, hordenine, N-methyltyramine, volatile oils, and carotenoids.**

- 
- **Synephrine** has effects that are similar to ephedrine.
 - It is a mild stimulant that has gotten a lot of attention in the world of sports nutrition.
 - Synephrine mainly stimulates **Beta-3 receptors** that are responsible for lipolysis and thermogenesis.

Athletic Benefits of Citrus Aurantium:

Ephedrine is prohibited when its urinary concentration is greater than 10 mcg/ml.

The potential athletic benefits are as follows:

- **a)** May improve athletic performance by acting as a mild stimulant.
- **b)** Promotes mental clarity.
- **c)** Helps promote athletic agility.
- **d)** Useful in weight loss by decreasing appetite and increasing basal metabolic rate (BMR).

Non – Athletic Benefits of Citrus Aurantium:

Citrus aurantium may be beneficial in the following conditions:

- **a) Gastrointestinal discomforts, such indigestion, constipation, and abdominal pain.**
- **b) Insomnia.**
- **c) Weight management.**
- **d) Loss of appetite.**

Citrus Aurantium Triple Paradox:

Depending on whether you take extracts of the leaves or peels of the immature or mature fruits, citrus aurantium shows **three paradox effects**:

- **a)** It may **increase appetite**, while it could suppress appetite due to a high amount of pectin.
- **b)** It acts as a mild stimulant, while it has been used as a **sedative in insomnia** as well.
- **c)** While some has used it for high blood pressure, it actually **increases blood pressure**.

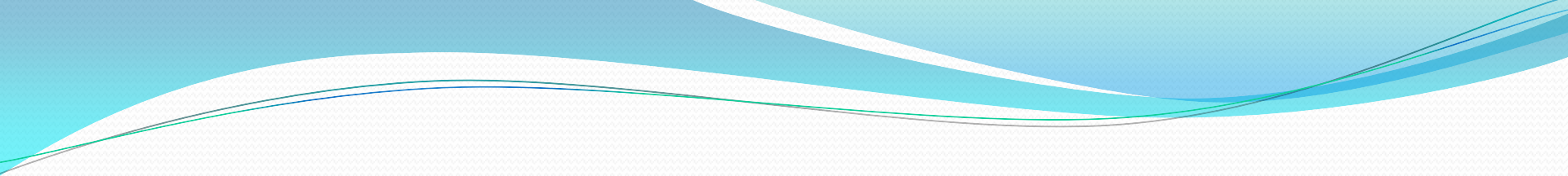
Dosage and Interactions:

- Citrus aurantium is available as “**bitter orange extract**” containing **2 – 6% synephrine**.
- The recommended dosage is **200 – 400 mg** of the extract.
- Similar to grapefruit, citrus aurantium interacts with the medications that are metabolized by the enzyme complex called **cytochrome P450**.

Contraindications:

Citrus aurantium should be avoided in the following conditions:

- **a)** People with high blood pressure.
- **b)** People with depression who take the medications MAO inhibitors. Citrus aurantium contains tyramine that interacts with MAO inhibitors, leading to hypertensive crisis (a sudden increase in blood pressure).
- **c)** Heart diseases.

- 
- **d)** Along with statins, the cholesterol – lowering medications.
 - **e)** Pregnancy and breastfeeding.
 - **f)** Raynaud`s phenomenon.
 - **g)** Peripheral artery disease.
 - **h)** Diabetic vascular involvement.

Guarana:

- Known also as **Brazilian cocoa**, guarana is a plant from maple family and native to the Amazon basin particularly Brazil.
- It is considered a stimulant and is often added to sports drinks.
- The active ingredients in guarana are **guaranine, caffeine, tannins, theobromine, polyphenols, and theophylline.**





Athletic Benefits of Guarana:

- a) **Improves athletic performance.**
- b) **Delays fatigue and exhaustion.**
- c) **Increases endurance.**
- d) **May increase aerobic capacity.**
- e) **May improve mental alertness and sharpness.**

Non – Athletic Benefits of Guarana:

Guarana has also non – athletic benefits, such as:

- a) Delays sleep and fatigue.
- b) Promotes weight loss.
- c) May impair appetite.
- d) Helps recover from a hangover.
- e) May help people with chronic fatigue syndrome.
- f) Useful in diarrhea.
- g) May help relieve headache.
- h) Has a mild diuretic effect.

Dosage:

- Guarana is generally added to many energy drinks.
- It is also available as guarana extract.
- A common dosage ranges from **100 to 1000 mg a day**.

Side Effects:

- The possible side effects of guarana are insomnia, anxiety, palpitation, nervousness, restlessness, stomach upset, nausea, increased blood pressure, rapid breathing, trembling, and urinary frequency.
- It is strongly recommended not to take guarana along with caffeine, ephedra, and central nervous system – simulating medications.

IV) Estrogen Metabolism Modulators:

- This group of weight loss aids are for women with **gluteal obesity** and **cellulite on the thighs**.
- They may prevent cellulite from getting worse and are unable to reverse the established cellulite.
- Indole - 3 - Carbinol.
- DIM (diindolylmethane).
- Sulforaphane.

Indole – 3 – Carbinol:

- Indole-3-carbinol is not a sulfur-containing substance but released from the sulfur-containing compounds the “glucosinolates”.
- It breaks down in the body into diindolylmethane (DIM).
- It alters the metabolism of estrogen.

Food Sources:

- Broccoli.
- Cabbage.
- Cauliflower.
- Collard greens.
- Brussels sprouts.
- Gai-lan.
- Kale.
- Mustard greens.



Broccoli, cauliflower, and cabbage are excellent sources of indole-3-carbinol.

Image: Copyright©Depositphotos.com/Luis Carlos Jimenez del Rio

Health Benefits:

- **a)** Reduces the risk of developing estrogen-related cancers by altering the metabolism of estrogen.
- **b)** Has an anti-viral, anti-bacterial, anti-androgenic, anti-inflammatory, and anti-cancer properties (cancers of the **cervix**, breast, and colon).
- **c)** Shows activity against HPV (human papilloma virus) (DIM).
- **d)** May help people with systemic lupus erythematosus (SLE).

Dose:

- Indole - 3 - Carbinol: 300 – 400 mg a day.
- DIM (diindolylmethane): 100 – 200 mg a day.

Interactions:

- Indole - 3 - Carbinol and DIM cause “enzyme induction”, lowering the effectiveness of the medications metabolized by Cytochrome P450 1A2, such as clozapine and haloperidol.

Sulforaphane:

- Sulforaphane is a subclasses of **isothiocyanates**.
- Isothiocyanates are sulfur-containing substances (pigments) responsible for the color of green in some plants.
- Other Isothiocyanates are:
 - Allyl isothiocyanate.
 - Benzy isothiocyanate.
 - Phenethyl isothiocyanate (PEITC).

Food Sources:

- Arugula
- Bok Choy
- Broccoli
- Brussels sprout
- Cabbage
- Cauliflower
- Collards
- Gai-lan
- Kale
- Kohlrabi
- Leek
- Mustard greens
- Radish
- Spinach
- Turnip
- Turnip greens
- Watercress.

Health Benefits:

- **a)** Has anti-oxidative activity..
- **b)** Shows anti-inflammatory activity.
- **c)** Enhances liver detoxification.
- **d)** Induces apoptosis (programmed cell death; cell suicide) in certain cancers.
- **e)** Inhibits the growth of *Helicobacter Pylori*.

Dose:

- Sulforaphane: 200 – 400 mg a day.

Homework:

- 1) Describe how guarana could be useful in sports.
- 2) Describe the health benefits of Indole – 3 – Carbinol.



