Let's Excel Together

CANADIAN ACADEMY OF SPORTS NUTRITION

Lecture 5:

Inflammation and Diet

Copyright Protection:

Inflammation:

- **Inflammation is classified as *acute* and *chronic*.**

- ***Acute inflammation* is an immediate response of the body to injury or any other harmful stimuli. It is the body`s effort to heal itself.**

- **In an inflammation, plasma and white blood cells (especially neutrophils) rush from the blood into the injured area.**

- **Inflammation is a protective mechanism by the body to remove the harmful stimuli and to initiate the healing process.**

- **Inflammation is not a synonym for infection, even in cases where inflammation is caused by infection. Although infection is caused by a microorganism, inflammation is one of the responses of the body to the microorganism.**

- **Without inflammation, wounds and infections would never heal.**

Hemodynamic Changes:

- **1) Initial transient contraction of the vessels**
- **2) Massive vasodilatation**
- **3) Increased permeability**
- **4) Blood flow slows (stasis) due to increased viscosity**

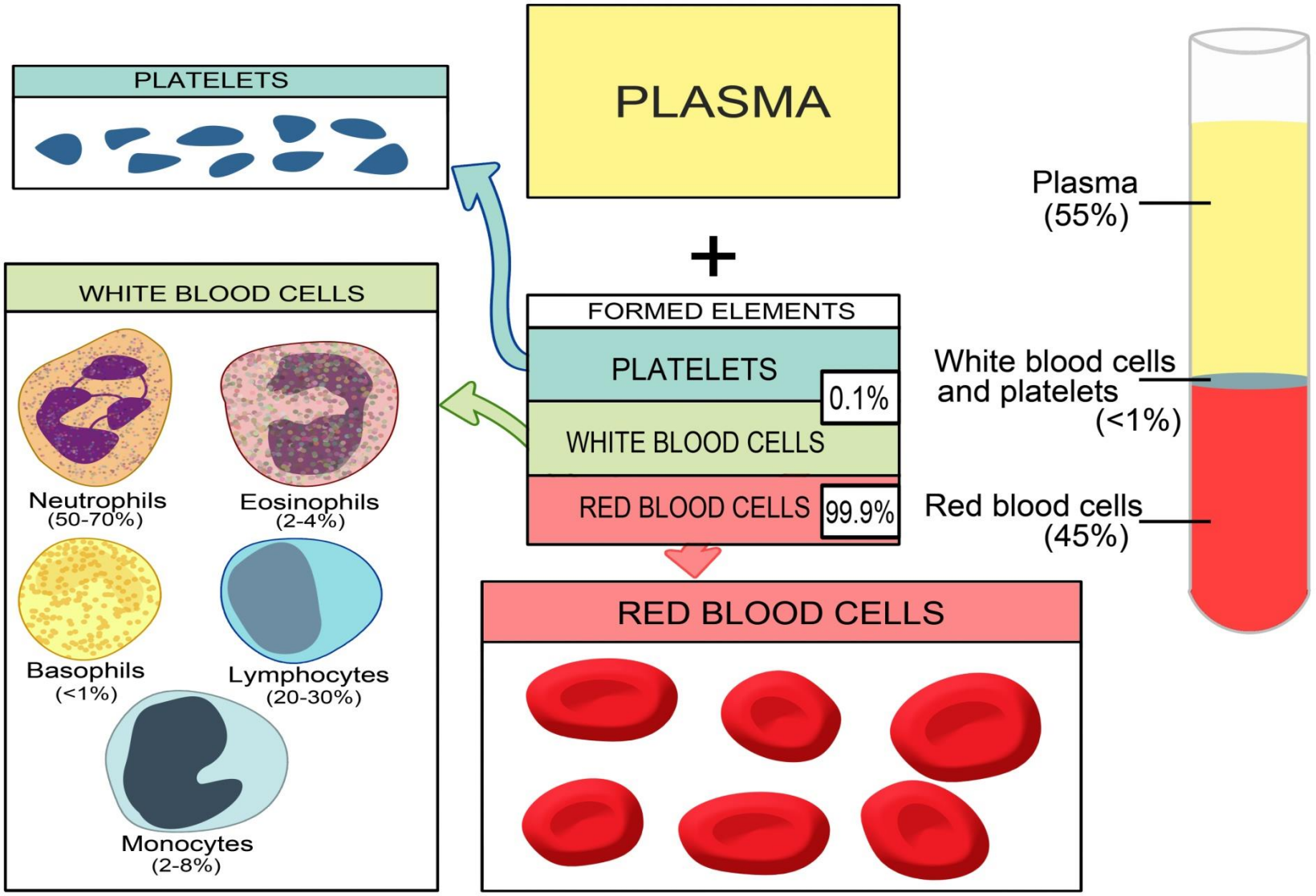
Chronic Inflammation:

- **In chronic inflammation, there is a progressive shift in the type of cells that would come to the site of inflammation, mainly lymphocytes.**

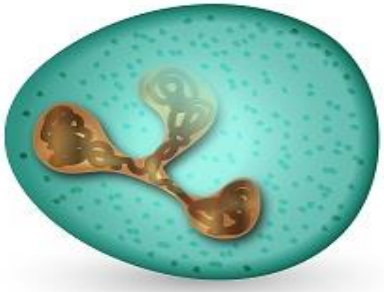
- **It is characterized by simultaneous destruction and healing of the tissue from the inflammatory process.**

What are the signs and symptoms of inflammation?

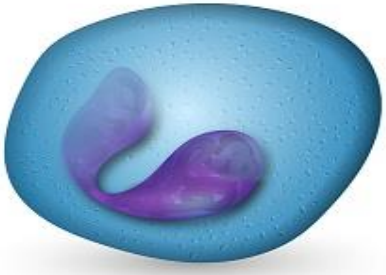
THE ELEMENTS OF BLOOD



Different Types of White Blood Cells:



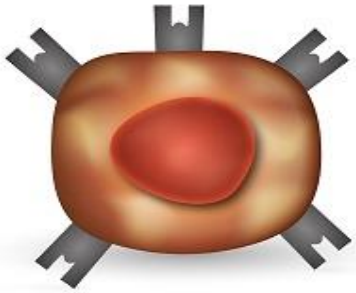
Neutrophil



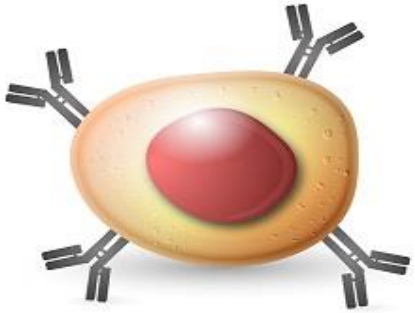
Eosinophil

Basophil

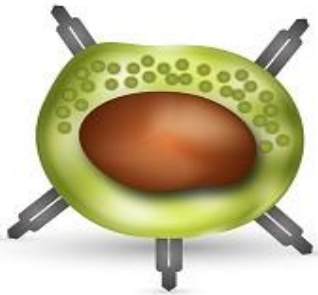
Monocyte



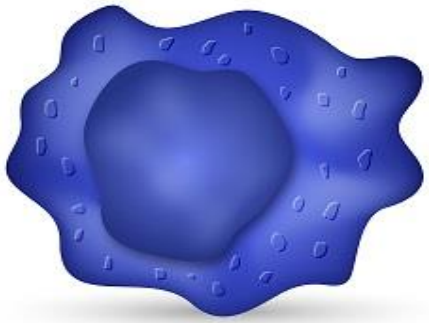
T Cell



B Cell



Natural killer



Macrophage

Five Cardinal Manifestations of Acute Inflammation:

English	Latin	Cause
Pain	Dolor	Stimulation of nerve endings due to release of chemicals
Redness	Rubor	Increased blood flow
Immobility (loss of function)	Functio laesa	Multiple causes
Swelling	Tumor/Turgor	Accumulation of fluid
Heat	Calor	Increased body core temperature

Ankle Sprain. *Image: Copyright©Depositphotos.com /Dmitriy Sechin*

Inflammatory Conditions:

- Sports injuries.
- Bursitis.
- Tendinitis.
- Arthritis.
- Asthma.
- Colitis.

Dietary Approach to Inflammation:

- **Restricted foods.**
- **Recommended foods.**
- **Recommended supplements.**

Restricted Foods:

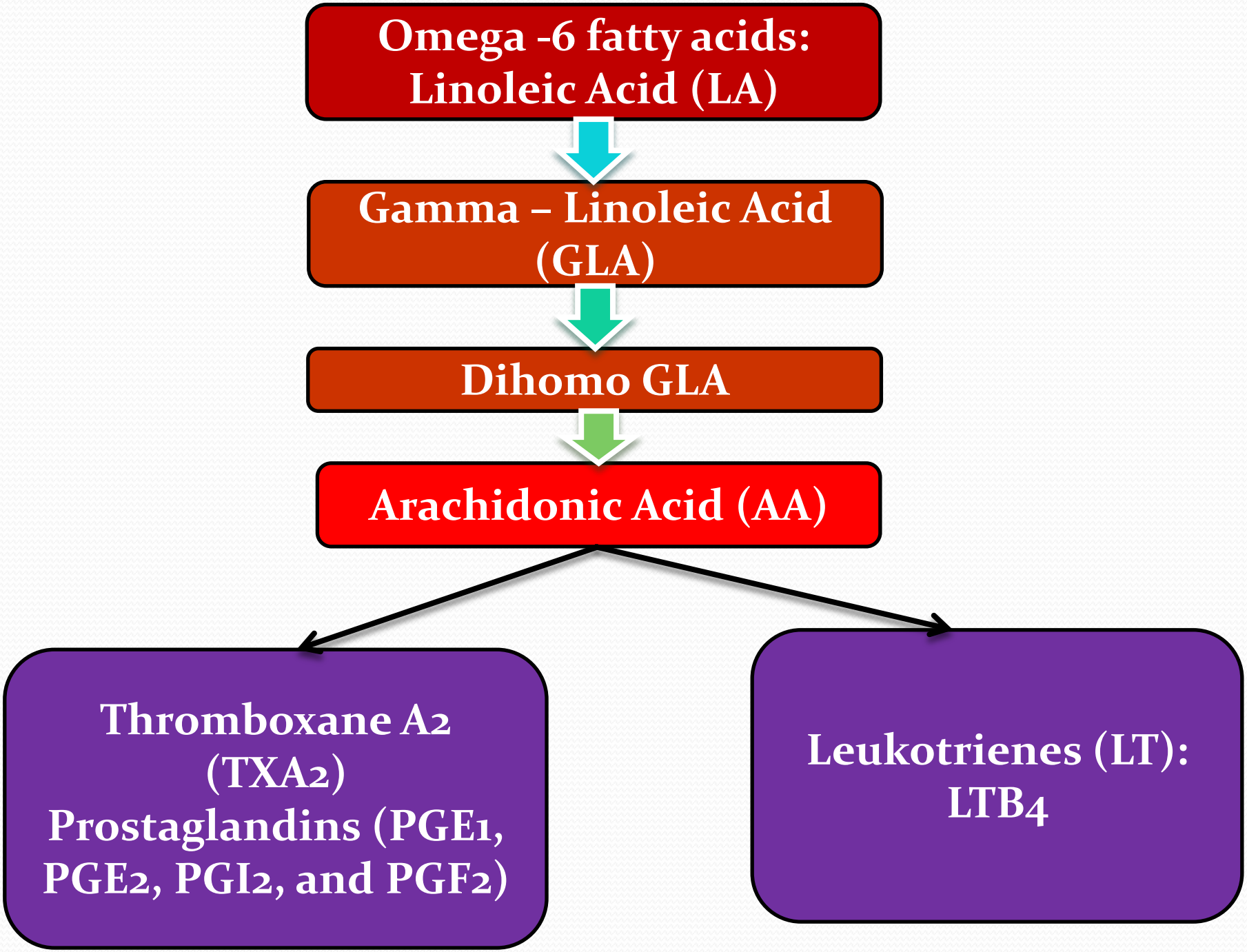
- a. Saturated fats.
- b. Trans-fats.
- c. Processed foods.
- d. Fried foods.
- e. Sugars and sweets. They delay healing process.
- f. dairy products.
- g. red meats.
- h. eggs.
- i. Alcohol .

- j. **Foods high in solanine: potatoes, tomatoes, eggplants**, and **peppers**.
- **Solanine is a poisonous plant alkaloid produced by the plants from nightshade family as a natural defense mechanism against external microorganisms. Solanine exacerbates inflammation.**

- **k. Foods high in Omega-6 fatty acids: soy, sunflower oil, safflower oil, corn oil, borage oil, sesame oil, and evening primrose oil.**

- **Omega-6, particularly *Alpha-Linoleic Acid*, is a pro-inflammatory.**

- **Arachidonic acid is a type of Omega-6, mostly found in beef fat and egg yolk.**


Omega -6 fatty acids: Linoleic Acid (LA)
Gamma – Linoleic Acid (GLA)
Dihomo GLA
Arachidonic Acid (AA)
Thromboxane A2 (TXA2) Prostaglandins (PGE1, PGE2, PGI2, and PGF2)
Leukotrienes (LT): LTB4

Fruits and Veggies High in Omega-6:

- **Any fruits and veggies that contain Omega-6 three times more than Omega-3:**

Veggies	Omega-3 (mg)	Omega-6 (mg)
Arrowroot	21	89
Avocado	220	3395
Corn	25	835
Eggplant	13	63

Fruits	Omega-3 (mg)	Omega-6 (mg)
Cherimoya	N/A	350
Coconut, meat	0	365
Fig	0	28 – 72
Olive (100 gr)	92	1215
Passion Fruit	3	968
Prickly Pear	34	276
Quince	0	122

Recommended Foods:

- 1) Cold water fish: salmon, and mackerel.
- 2) Flaxseeds.
- 3) Chia seeds.
- 4) Hemp seeds.
- 5) Fresh fruits and vegetables, except solanine-containing veggies.
- 6) Fruits high in flavonoids: berries, and red grapes.
- 7) Ginger.
- 8) Pineapple.
- 9) Cayenne pepper.
- 10) Garlic
- 11) Spices high in antioxidants: sumac, turmeric, and cinnamon.

Dietary Anti- Inflammatory Agents (DAIAs):

Phytonutrients	Amino Acids	Herbs
Bromelain	Glutamine	Aloe vera
Carotenoids	Lysine	Arnica
Flavonoids		Boswellia
Saponins		Echinacea
Terpenes		Garlic
		Ginger
		Gotu Kola
		Licorice
		Turmeric
		White willow bark

Arnica:

- **It is a plant from sunflower family.**
- **The active ingredient in Arnica is "*Helenalin*", which is a type terpene and is a powerful topical anti-inflammatory agent.**
- **Is used mostly for bruise.**
- **Arnica oil is applied 2 to 3 times a day to the affected area. It reduces pain, soreness, bruise and swelling.**

Arnica:

Bromelain:

- It is a protease enzyme extracted from pineapple.
- It is a potent anti – inflammatory agent.
- Eases digestion.
- Is used 1500 mg a day.

Licorice:

- **Licorice is an adaptogenic herb used extensively throughout the world.**

- **Also known as sweetwood, sweetroot, the great detoxifier, and the great adrenal supporter, licorice has anti – viral, anti – bacterial, and anti – inflammatory properties.**

- **The active ingredients in licorice are glycyrrhizin, flavonoids, anethole, and isoflavones.**

- **The sweetness of licorice results from glycyrrhizin, which is about 40 times sweeter than sugar.**

Licorice:

Athletic Benefits of Licorice:

- 1) Helps recover from overtraining syndrome.
- 2) Has a protective effect against overtraining syndrome.
- 3) Reduces inflammation in strains and sprains.
- 4) May accelerate recovery from sports injuries.

Non – Athletic Benefits of Licorice:

- 1. Adrenal exhaustion
- 2. Peptic ulcer.
- 3. Gastritis.
- 4. Gastroesophageal reflux disease (GERD).
- 5. Asthma.
- 6. Chronic obstructive pulmonary disease (COPD).
- 7. Chronic fatigue syndrome.

- 8. Inflammatory bowel disease (IBD).
- 9. Cough.
- 10. Sore throat.
- 11. Canker sore.
- 12. Eczema.

Dosage and Side Effects:

- **Licorice is available in two forms: standardized licorice and DGL (de – glycyrrhizinated licorice).**

- **Licorice can be used as dried root 4 – 6 grams a day, standardized extract 500 – 1500 mg a day, DGL 500 – 1500 mg a day, or chewable DGL 500 – 1500 mg a day.**

- **The chewable form should be chewed about 20 minutes before meal and bedtime.**

Contraindications of Licorice:

- a) Heart disease.
- b) Congestive heart failure.
- c) Edema.
- d) Liver disease.
- e) Kidney disease.
- f) High blood pressure.
- g) Hypokalemia (low potassium level).
- h) Erectile dysfunction.
- i) Diabetes.
- j) Pregnancy.

Interactions:

- a) **Warfarin:** licorice reduces its blood level and effectiveness.
- b) **Corticosteroids:** licorice may increase their effects.
- c) **Digoxin:** licorice may increase digoxin toxicity.
- d) **Anti – diabetic medications and insulin:** licorice may increase blood sugar level.
- e) **Birth control pills:** licorice may increase their side effects particularly rising blood pressure.
- f) **MAO inhibitors:** licorice may enhance their effects.

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) Helpful in psoriasis.
- k) It may lower nitric oxide (NO) level, which could affect negatively athletic performance

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.**

Abazar`s Blend for Inflammation:

- **Curcumin:** 1500 mg a day.
- **Bromelain:** 1500 mg a day.
- **Glutamine:** 10 grams a day.
- **French Maritime Pine Bark Extract:** 300 mg a day.
- **Omega-3 Fatty Acids:** 3 grams a day.

Homework:

- 1) Describe the benefits of curcumin.
- 2) Describe restricted foods in an athelete with a sports injury.