Let's Excel Together

CANADIAN ACADEMY OF SPORTS NUTRITION

Lecture 30:

How to Naturally Increase Testosterone

Part 3

Copyright Protection:

Testosterone – Boosting Supplements:

- Boron.
- Chrysin.
- Damiana.
- DHEA.
- Maca Root.
- Nettle .
- Pygeum Africanum.
- Saw Palmetto.
- Smilax.
- Tribulus Terrestris.
- Vitamin E.
- Zinc.

Pygeum Africanum (PA):

- **Known also as prunus Africana, red stinkwood, iron wood and African prune.**

- **Pygeum is an evergreen tree native to Africa.**

- **The active ingredients in pygeum responsible for its activities are beta – sitosterol, pentacyclic terpenes, and ferulic acid.**

- **The mechanism of action of pygeum is the same as saw palmetto. Basically, it blocks the enzyme 5 –alpha reductase, reducing the conversion of testosterone to dihydrotestosterone (DHT).**

Athletic Benefits of Pygeum:

- a) It may boost testosterone level.
- b) It may protect from overtraining syndrome.
- c) It may delay fatigue.

Non – Athletic Benefits of Pygeum:

- The following conditions may benefit from pygeum:
- d) Benign prostatic hyperplasia (BPH).
- e) Prostatitis.
- f) Hair loss.
- g) Low sex drive.

Dosage:

- **Pygeum africanum is available commercially in tablet, capsule, or liquid form either alone or in combination.**

- **The usual dosage is 100 – 200 mg a day.**

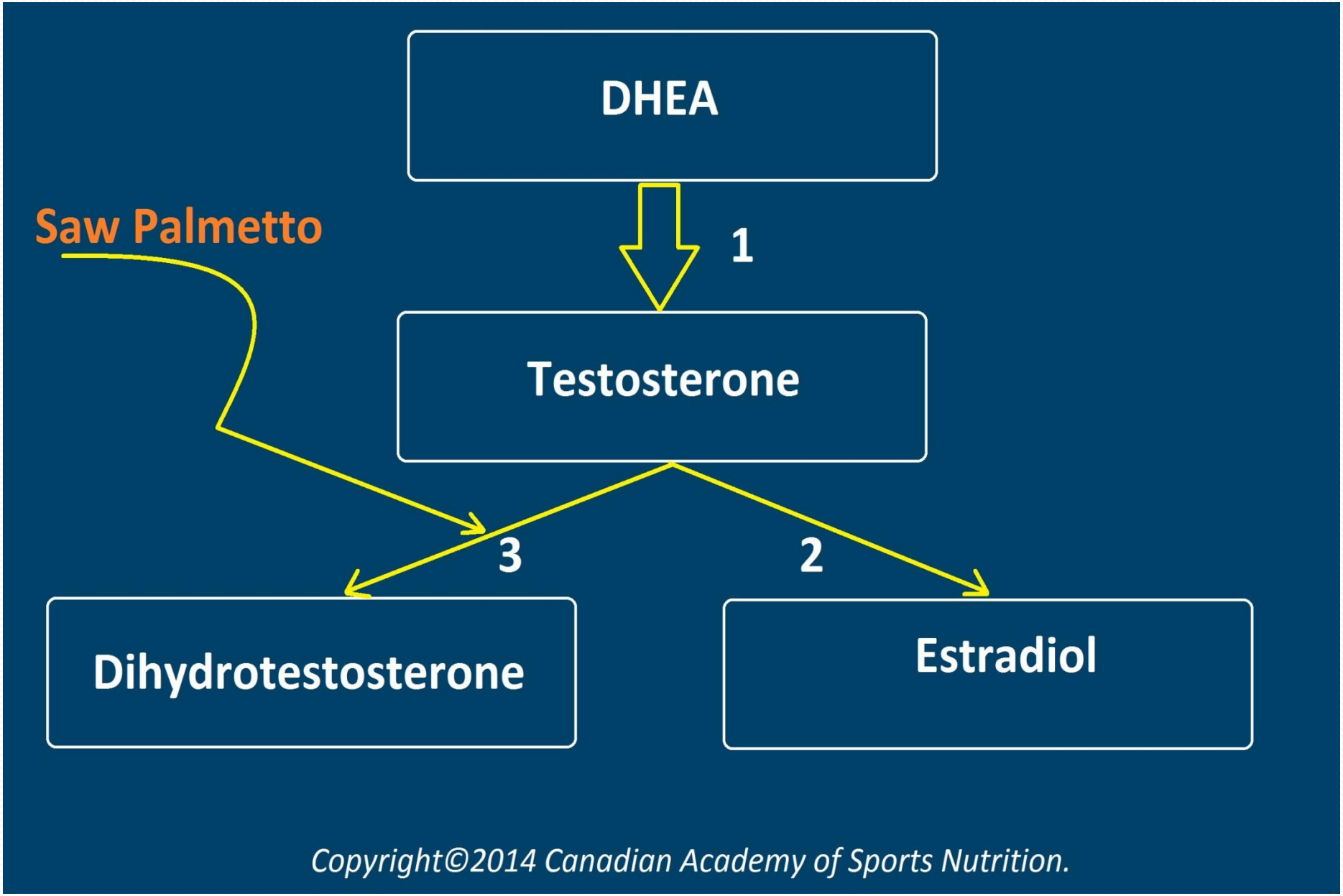
Saw Palmetto:

- **Also called cabbage palm and American dwarf palm.**

- **It is an herb that Native Americans have been using to:**

- **increase sexual drive**
- **treat infertility and impotence in men.**

Mechanism of Action:



Non – Athletic Benefits of Saw Palmetto:

The following condition may benefit from saw palmetto:

- **a) Benign prostatic hyperplasia (BPH).**
- **b) Prostatitis.**
- **c) Hair loss.**
- **d) Low sex drive.**
- **e) Chronic bronchitis.**
- **f) Coughs and sore throat.**

Dosage:

- **The dosage of saw palmetto in studies has been 160 to 750 mg per day.**

- **Pygeum extract, nettle extract, ginkgo biloba, and zinc have synergistic effects with saw palmetto.**

Smilax:

- It is extracted from the root of **sarasaparilla**, also known as **carrion flower**.

- Smilace, Zarzaparilla, Saparna, and Khao Yen are other names for smilax.

Smilax has been used in folk medicine for centuries by the native people of the central and South America and in China for the following reasons:

- **As an aphrodisiac.**
- **To treat infectious diseases such as syphilis, leprosy, and gonorrhea.**
- **To treat skin disorders, such as psoriasis.**
- **To treat rheumatism and impotence.**
- **As an anti-inflammatory agent.**
- **To treat increased blood pressure.**

Mechanism of Action:

Constituents of Smilax:		
Plant Steroids	**Saponins**	**Minerals**
Neotigogenin Pollinastanol Sarsasapogenin Sitosterol Smilagenin Stigmasterol	Sarsasaponin Smilasaponin	Aluminium Calcium Chromium Iron Magnesium Manganese Selenium Silicon Zinc

Why Athletes Use Smilax:

- **The claimed ability of smilax to increase the levels of testosterone makes it a favorite herbal sports supplement of body builders and strength athletes.**

- **Most of the athletes use smilax as a ”*steroid replacer*”.**

- **It has anabolic effect and can be used as an alternative for harmful steroid hormones.**

Smilax may improve athletic performance by the following means:

- 1. Sitosterol, a plant steroid found in smilax, can be metabolized to pregnenolone and, therefore, to DHEA
- 2. Some say that the saponins in smilax can chemically convert into human steroids, such as testosterone.
- 3. Smilax is high in Zinc, a testosterone-increasing mineral.

- **4. Its anti-inflammatory effect may help athletes recover rapidly from sustained sports injuries and continue their exercise without feeling pain or discomfort.**

- **5. Chromium is another mineral that exists in smilax. Most research indicate that chromium is capable of burning fat and increasing muscle mass.**

- **6. Smilax has a mild diaphoretic and diuretic effect. This feature may help bodybuilders counteract water retention during the period before competition to define their muscles.**

Dosage and Side Effects:

It must be used sublingually.

- **Non-athletes : 5 - 10 drops per day.**
- **Athletes: 10 - 15 drops per day.**

- **Although no toxicity or adverse effects have been reported for smilax, consumption of high doses may result in mild abdominal cramps and transient diarrhea.**

Tribulus Terrestris:

- **Tribulus terrestris is an herb from the Zygophyllaceae family.**

It has a woody taproot and bright yellow flowers. The parts of the herb that are used include the fruit and roots; it is also used as a dried herb.

- **Known also as puncture vine, caltrop, cathead, and godkharu.**

- **Tribulus terrestris grows in various parts of the word from Australia to Europe.**

- **This herb has been used for centuries in Europe, mostly in Bulgaria, to treat hormone insufficiency in men and women.**
- **Ancient Greeks: as a diuretic and general tonic.**
- **Chinese herbalists: treatment of liver, kidney and urinary tract diseases, skin disorders, and cardiovascular diseases.**
- **Ayurvedic physicians and herbalists: diuretic and aphrodisiac.**

Constituents and Mechanism of Action:

Constituents of Tribulus Terrestris:	
Active Components	**Examples**
Plant steroids	furostanol, sitosterol, and campesterol
Steroids saponins	glucopyranosyl, galactopyran, ruscogenin, terrestrosins, hecogenin, dioscin, diosgenin, gracillin, kikuba saponin, protodioscin, neohecogenin, and tribulosin
Flavonoids	kampferol, and quercetin
Isoflavons	daidzein,and genistein
Fatty Acids	palmitic acid, stearic acid, Oleic acid, and linoleic acid
Glycosides	kampferol glycoside and neohecognin Glycoside

- **Tribulus terrestris can elevate testosterone levels by boosting the blood level of LH.**
- **Also, it can increase the levels of estradiol by affecting the FSH level.**
- **Tribulus terrestris exhibits an anti-inflammatory effect as well.**

Tribulus Terrestris and Athletes:

- **Tribulus terrestris has become a popular sports supplement among athletes, mostly the power athletes, such as bodybuilders and weight lifters since 1996.**

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- **The great achievements by the Eastern Europe weightlifters in Olympic and world championship events during the past three decades are attributed to the use of the herb as a sports supplement.**

- **1) Studies have shown that the Tribulus terrestris herb increases testosterone levels 30% to 50% in only five days. Tribulus terrestris elevates testosterone levels by increasing LH level.**

- **2) Also, isoflavons like daidzein and genistein in the herb increase the levels of testosterone by preventing its conversion to estrogen.**

- **3) Another reason that athletes use Tribulus terrestris is for its tonic feature; it decreases fatigue, enhances mood and well-being, and improves stamina and endurance.**

Non – Athletic Benefits:

- To improve sexual drive in men and women.
- To improve reproductive functions, including sperm production and ovulation.
- To reduce cholesterol levels in the blood.
- To help with kidney stones, painful urination, and incontinence.
- To treat vertigo.
- To enhance stamina.
- As a tonic and mood enhancer.
- As a mouth wash for treating painful gums.

Dosage and Side Effects:

- **Suggested dose: 500 to 1500 mg daily.**
- **Some herbalists and Ayurvedic physicians recommend up to 3000 mg per day.**
- **When taken as a dietary supplement, Tribulus terrestris produces no adverse effect or toxicity.**

Vitamin E (Tocopherols):

- **Vitamin E is a fat soluble vitamin and a collective name for tocopherols and tocoteriols.**
- **Being famous as the "*fertility vitamin*", vitamin E acts as a potent antioxidant.**
- **Among the eight isomers of tocopherols, alpha – tocopherol and gamma – tocopherol are the two most common forms.**

Functions of Vitamin E:

- a) It is an antioxidant and scavenges the pyroxyl radicals.

- b) It inhibits the synthesis of prostaglandins and the activities of protein kinase C and phospholipase A2.

Vitamin E. *Image: Copyright©Depositphotos.com/nikesidoroff*

- **c) It protects cell membranes, unsaturated fatty acids, adrenal hormones, and LDL cholesterol from oxidation.**

- **d) It protects the lungs from oxidative damage caused by environmental substances.**

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- e) It shows anti – inflammatory activity.
- f) It demonstrates anti – coagulating activity.
- g) It may prevent platelet aggregation.
- h) The function and effectiveness of vitamin E is enhanced by vitamin C, Co – Enzyme Q10, selenium, glutathione, and beta – carotene.

Food Sources and Absorption:

- **Vitamin E is found in wheat germ oil, safflower oil, seeds, nuts, whole grains, egg yolks, butter, milk, liver, and green leafy vegetables.**

- **It is absorbed along with fats and bile salts from the small intestine and then is transported to the liver.**

- **The absorption of vitamin E is decreased by chlorine and mineral oils.**

- **Estrogens may deplete vitamin E from the body.**
- **The absorption of vitamin E from the skin is poor.**
- **Vitamin E is not stored as good and effectively as other fat soluble vitamins.**
- **Small amounts are mainly stored in the fatty tissues and liver.**
- **It is also stored in the heart, testicles, adrenal glands, uterine, muscles and pituitary gland.**

Athletic Benefits of Vitamin E:

- a) It may prevent exercise – induced muscle damage.
- b) It has a protective effect against post – exercise rhabdomyolysis (post – exercise myoglobinuria).
- c) It may prevent overtraining syndrome.
- d) It speeds up recovery from intense training sessions.
- e) It may boost the production of steroid hormones by the adrenal glands, supporting muscle growth.

Non – Athletic Benefits of Vitamin E:

The following conditions may benefit from vitamin E:

- **Anemia.**
- **Alzheimer's disease.**
- **Epilepsy.**
- **Cancers (lung, colon, and prostate).**
- **Intermittent claudication.**
- **Infertility.**
- **Tardive dyskinesia.**
- **Skin problems, such as dermatitis, ulcers, lupus, burns, and allergies.**

- **i) Endometriosis.**
- **j) Dysmenorrhea.**
- **k) Premenstrual syndrome (PMS).**
- **l) Preeclampsia.**
- **m) Diabetes and diabetic retinopathy.**
- **n) Cold sores.**
- **o) Shingles (Zona).**
- **p) Fibrocystic disease of breast.**
- **q) Osteoarthritis.**

- **Rheumatoid arthritis.**
- **Strains and sprains.**
- **Lung disorders, such as bronchitis and cystic fibrosis.**
- **Eye problems, such as cataract and age – related macular degeneration.**
- **Cardiovascular problems, such as angina pectoris and hypertension.**
- **Leukoplakia.**
- **Compromised immune system.**
- **High LDL cholesterol.**
- **Fibromyalgia.**

Dosage:

Recommended Daily Allowance (RDA) for Vitamin E:		
Category/Condition	**Age (year)**	**Vitamin E**
Infant	0.0 – 0.5	4 mg (6 IU)
	0.5 – 1.0	5 mg (7.5 IU)
Children	1 – 3	6 mg (9 IU)
	4 – 6	7 mg (10.50 IU)
	7 – 10	7 mg (10.50 IU)
Males	11 – 14	11 mg (16 IU)
	15 – 18	15 mg (22 IU)
	19 – 24	15 mg (22 IU)
	25 – 50	15 mg (22 IU)
	>50	15 mg (22 IU)
Females	11 – 14	11 mg (16 IU)
	15 – 18	15 mg (22 IU)
	19 – 24	15 mg (22 IU)
	25 – 50	15 mg (22 IU)
	>50	15 mg (22 IU)
Pregnancy		15 mg (22 IU)
Breastfeeding	1st 6 months	20 mg (30 IU)
	2nd 6 months	19 mg (28 IU)
Athletes		20 – 30 mg (30 – 45 IU)

- 1 mg equals to 1.49 IU.
- Pills come as 100 – 400 IU.

Side Effects:

High dosage of vitamin E (more than 400 to 800 IU per day for a long time) may cause:

- **Blurred vision.**
- **Breast enlargement.**
- **Diarrhea.**
- **Lightheadedness.**
- **Flu-like symptoms.**
- **Headaches.**
- **Nausea or stomach cramp.**
- **Muscle weakness.**
- **Fatigue.**

Dosage higher than 800 IU per day for a prolonged time:

- **impairs the immune system.**
- **disorders sexual drive.**
- **increases the risk of bleeding in people with vitamin K deficiency.**

Interactions:

Vitamin E may increase the effectiveness of the following medications:

- 1) Warfarin.
- 2) Anti – platelet medications.
- 3) Cyclosporine.

Vitamin E may decrease the effectiveness of the following medications:

- 1) Levostatin.
- 2) Ketoconazole.

Estrogen – containing birth control pills may lower blood levels of vitamin E.

Zinc:

- **Zinc is an antioxidant mineral and a component of many enzymes involved in most metabolic processes and digestion.**
- **Zinc plays an important role in the formation of protein in the body.**
- **Zinc is involved in various functions of the body from cell growth to testosterone production.**

Effects of Zinc:

- Increases testosterone levels.
- Assists in wound healing and speeding the union of the bone fractures.
- Plays a role in blood formation.
- Supports the immune system.
- Acts as an anti-aging agent by fighting free radicals.
- Involves in the formation of hair and nails.
- Useful in general growth and fetal development.

- **Increases appetite.**
- **Essential for normal taste.**
- **Affects behavior and learning performance.**
- **Is an important mineral for the prostate gland.**

Zinc Deficiency:

- **Approximately 80%** of the total body zinc is in the **muscles** and **bones**.

- The prostate gland, eyes, heart, spleen, lungs, adrenal glands and skin have high concentrations as well.

- Because the normal amount of zinc in the body is low and there is no storage source to supply it, its level is easily compromised.

- **Zinc deficiency usually results from diet insufficiency.**
- **Vegetarians are most likely to have zinc deficiency.**
- **Hard exercise and stress are other causes.**

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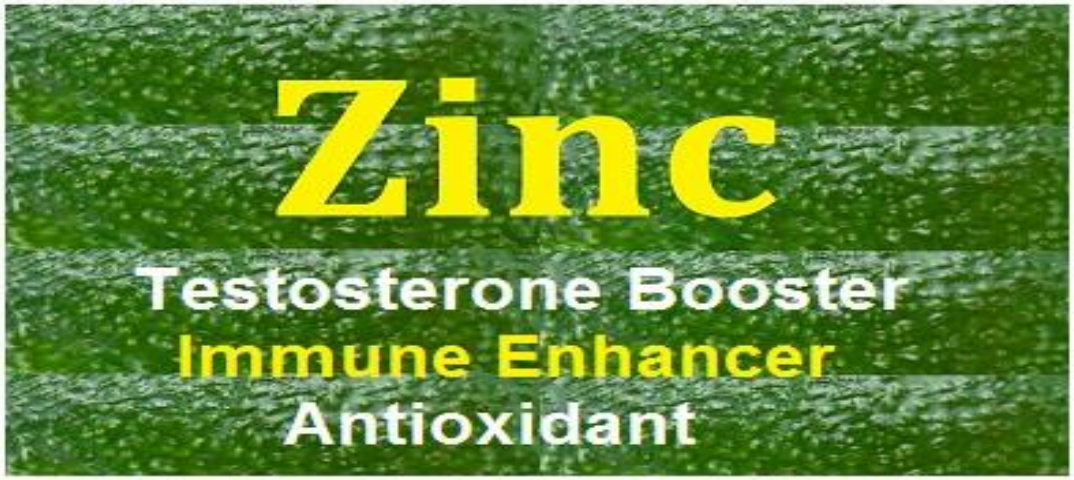
- **Zinc deficiency is so widespread that some researchers suggest zinc supplementation for lots of conditions from hair loss to low sexual drive.**



Clinical features of zinc shortage include:

- growth retardation and short stature.
- low libido in men and women
- diminished axillary, facial and pubic hair.
- loss of ability to smell and taste.
- night blindness.
- impaired thyroid function.
- poor appetite.
- delayed healing of wounds and burns.

- Zinc deficiency may predispose people to alcoholic cirrhosis.

Non – Athletic Benefits of Zinc:

The following conditions may benefit from zinc:

- **a) Acne.**
- **b) Anemia (that not responding to iron supplementation).**
- **c) Wound healing.**
- **d) Broken bones.**
- **e) Male infertility.**
- **f) Common cold.**
- **g) Anorexia nervosa.**
- **h) Crohn`s disease.**
- **i) Diabetes.**

- **j) Age – related macular degeneration.**
- **k) Strains and sprains.**
- **l) Cold sores.**
- **m) Genital herpes.**
- **n) Canker sores.**
- **o) Skin ulcers (topical).**
- **p) Burns (topical).**
- **q) Acrodermatitis enteropathica.**
- **r) Infections.**
- **s) Compromised immune system.**
- **t) Osteoporosis.**

- **u) Liver problems: liver cirrhosis, and hepatitis C.**
- **v) Night blindness.**
- **w) Metabolic syndrome.**
- **x) Prostate problems: prostatitis, and benign prostatic hyperplasia (BPH).**
- **y) Down`s syndrome.**
- **z) Cystic fibrosis.**

Food Sources:

Zinc Rich Foods:	
Plant Sources	**Animal Sources**
Lentils **Beans** **Sunflower seeds**	**Oysters** **Red meat, beef** **Crab** **Turkey** **Shrimp** **Yogurt, plain** **Cheese**

Dosage:

Recommended Daily Allowance (RDA) for Zinc:	
Age (year)/Status	**Zinc (mg)**
Infants (0.0-1.0)	5
Children (1-10)	10
Males (>11)	15
Females (>11)	12
Pregnancy	15
Breastfeeding	19
Athletes	30 – 300

Factors that decrease absorption of zinc:

- Calcium.
- Iron.
- Selenium.
- Soy products.
- Phytate.

Factors that increase absorption of zinc:

- Amino acids.

Homework:

- **1) Describe how vitamin E could have positive impact on athletic performance.**

- **2) List the benefits of zinc.**