ETTU COACHING CONFERENCE

NUTRITIONAL SUPPLEMENTS - USEFUL ADITIVES IN DAILY DIET OR UNNECESSARY SUBSTANCES?

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WADA

- The World Anti-Doping Agency (WADA) is not involved in the testing of dietary/nutritional supplements.
- Extreme caution is recommended regarding supplement use.
- The use of dietary supplements by athletes is a concern because in many countries the manufacturing and labeling of supplements may not follow strict rules, which may lead to a supplement containing an undeclared substance that is prohibited under anti-doping regulations. A significant number of positive tests have been attributed to the misuse of supplements and taking a poorly labeled dietary supplement is not an adequate defense in a doping hearing.
- Athletes must take care by themselves if the supplement is on doping list!

NUTRITIONAL SUPPLEMENTS: INTRODUCTION

- Food additives: substances, which are intended to supply the organism with nutrients that would otherwise not get in the food in necessary quantities.
- As food supplements we use: proteins, amino acids, fatt acids, vitamins, minerals, carbohydrates, fiber ....
- Unnecessary in a balanced diet ???
- BRO – SCIENCE???

NUTRITIONAL SUPPLEMENTS: PROTEINS

PROTEINS

- Proteins are made up of chains of amino acids (at least 50, typically> 100)
- They are a vital nutrient - amino acids are needed to build the body

- The source of the energy (1 gram of protein which is 4 kcal) - 8 to 10% of the daily energy introduced.
- Average requirement of protein for an adult is 0.8 g/kg bw/day.
- For adults is 2 g/kg bw/day, respectively. 2.5 - times the recommended daily allowance (RDA = recomended dietary allowance) the upper limit for protein intake, that did not expect side effects.
- The protein in the food should have a high biological value, which means that they contain a sufficiently high proportion of the essential amino acids

NUTRITIONAL SUPPLEMENTS: PROTEINS

Protein - shakes (powder), a protein plate.

- Varios types:

1) Whey protein
2) Casein
3) Protein from soy
4) Egg proteins,
5) Proteins from Rice
6) Protein from hemp
7) Proteins from pears

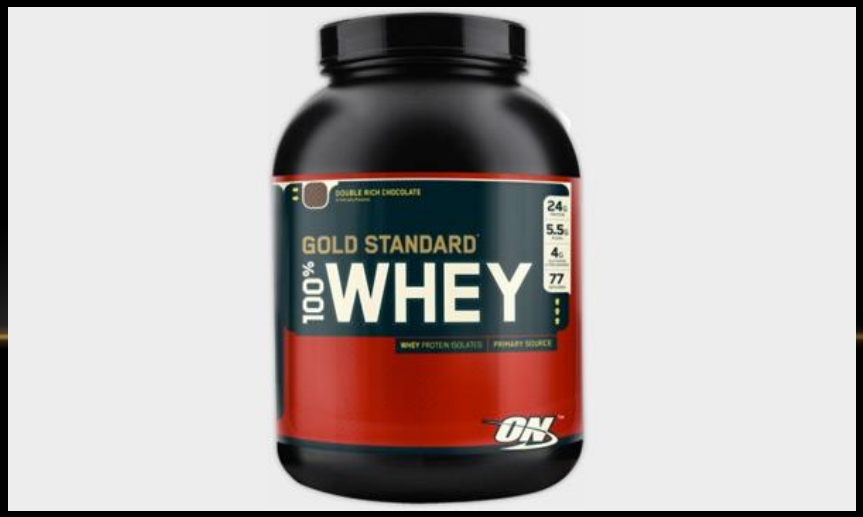
NUTRITIONAL SUPPLEMENTS: PROTEINS

Whey protein

- Whey protein (milk - cheese - whey - protein); human milk 60% W, 40% C.
- It contains large amounts of essential amino acids and BCAAs.
- Higher concentrations of cysteine (helps in the synthesis of glutathione).
- Benefit from it to promote the regeneration of muscle tissue.

- Three basic types: concentrate (29-89% protein), isolate (> 90% protein) hydrolyzate (treated with enzymes - CISC).

- Rapid absorption from the gastrointestinal tract (30 minutes); digestive problems.



NUTRITIONAL SUPPLEMENTS: PROTEINS

Casein

- Protein derived from milk
- Participates in the metabolism of amino acids, carbohydrates, calcium and phosphorus.
- When digested in the human body it forms a mass in the stomach - slow absorption (a few hours).

NUTRITIONAL SUPPLEMENTS: PROTEINS

Protein from soy

- Soy protein isolated from soy granules so that the shell is removed soybeans and fat.
- Contains a lot of Legumins, enzymes, phytoestrogens.
- Forms: flour, concentrate (70% protein), isolate (90% protein).
- Gynecomastia?
- Suitable for vegans and vegetarians.

Protein from eggs

- They are located in eggwhite (in whole egg is about 10% protein constituent).
- Suitable for lactose intolerant.

Aminoacids

- Aminoacids: organic acids consisting of an amino group (-NH2) and a carboxylic acid (-COOH), and chain specific to each AMK
- Essential: the organism can not be synthesize itself and are essential for the organism
- Conditionally essential: arginine, cysteine, glutamine, ornithine, proline, selenocistein, serine, tyrosine (normal organism by itself is synthesized, in certain conditions to be entered in the diet).
- Nonessential: alanine, asparagine, aspartic acid, glutamic acid, glycine.

Amino Acid	Main Food Sources
Histidine	soy protein, eggs, parmesan, sesame, peanuts
Isoleucine	eggs, soy protein & tofu, whitefish, pork, parmesan
Leucine	eggs, soy protein, whitefish, parmesan, sesame
Lysine	eggs, soy protein, whitefish, parmesan, smelts
Methionine	eggs, whitefish, sesame, smelts, soy protein
Cysteine	eggs, soy protein, sesame, mustard seeds, peanuts
Phenylalanine	eggs, soy protein, peanuts, sesame, whitefish
Tyrosine	soy protein, eggs, parmesan, peanuts, sesame
Threonine	eggs, soy protein, whitefish, smelts, sesame
Tryptophan	soy protein, sesame, eggs, winged beans, chia seeds
Valine	eggs, soy protein, parmesan, sesame, beef

NUTRITIONAL SUPPLEMENTS: AMINOACIDS

BCAA - branched-chain amino acids

- Valine, leucine, isoleucine
- Essential amino acids: 33% of muscle mass.

a) The functions in the body:
b) Anabolism/anticatabolism of muscle tissue,
c) Effects on the brain (the treatment of hepatic encephalopathy, signaling)
d) Increases the level of glucose in the blood,
e) Reduces appetite.

- As nutritional supplements: powders, pills
- 10-20 grams / day

NUTRITIONAL SUPPLEMENTS: AMINOACIDS

Creatine

- An amino acid that is found naturally in our body: helps supply cells with energy (primarily muscle) in a manner that increases the production of ATP (present in all animals and some plants)
- The organism produces it from AMK: glycine, methionine, arginine (50% receive from the food).
- It lowers the level of myostatin, raising the level of dihydrotestosterone, testosterone and IGF-1.
- As a dietary supplement: athletes of various profiles for the increase in body weight.
- European food safety authority (2004): 3 g daily do not cause any health problems, from 5 to 20 grams per day is safe, without side effects.
- Asthma , ICS, GI problems…
- Formats: monohydrate, gluconate (not the best), ethyl ester (worse) hydrochloride (more soluble), nitrate (no difference)

NUTRITIONAL SUPPLEMENTS: AMINOACIDS

Carnitine

- Synthetysed in body: in the body from lysine and methionine (liver, kidneys).
- Transports fatty acids in the cell, which are then used as an energy source.
- It reduces mortality and the incidence of arrhythmias in people after MI.
- Antioxidant.
- Research (as a medicine): MI, heart failure, angina pectoris, diabetic neuropathy
- Food: Red meat (beef 100 g = 95 mg carnitine, pork 28, chicken 4, cottage cheese 1, egg 0.01).
- Dosing: 1000 to 1500 mg 30 minutes before your workout

NUTRITIONAL SUPPLEMENTS: VITAMINS AND MINERALS

Magnesium

- Reduction of magnesium in the diet of modern Western countries (compared to earlier generations) may be related to food refining and modern fertilizers that contain no magnesium.
- Lack: the weakened muscles, tiredness, listlessness, tremors and muscle spasms, cardiac arrhythmias (one of the most dangerous).
- Dosing: up to 400 mg in form of fluids, tablets, powders….

NUTRITIONAL SUPPLEMENTS: VITAMINS AND MINERALS

B complex

- Lack: specific nutrition (a diet rich in carbohydrates and fat can cause vitamin B1 hypovitaminosis, especially among larger effort and sweating).
- 100% - 200% RDA

Vitamin D

- With normal healthy diet we get 100 IU of vitamin D / day (10% of daily needs).
- Vitamin D deficiency: rickets, increased risk of falls and fractures, reduction of muscle mass and strength, muscle aches, increase the risk of cancer, type 2 diabetes, cardiovascular disease ...
- Hypervitaminosis D - in patients taking the active forms of vitamin D: calcium increase.
- Dosing: 100% RDA.

NUTRITIONAL SUPPLEMENTS: ENERGY DRINKS

Energy drinks

- type of beverage containing stimulanting drugs, chiefly caffeine, which is marketed as providing mental and physical stimulation.
- may or may not be carbonated and many also contain sugar or other sweeteners, herbal extracts andamino acids (taurin).
- Energy drink is not same as sports drink.
- Energy drinks have the effects caffeine and sugar provide, but there is little or no evidence that the wide variety of other ingredients have any effect.
- Most of the effects of energy drinks on cognitive performance, such as increased attention and reaction speed, are primarily due to the presence of caffeine.
- Advertising for energy drinks usually features increased muscle strength and endurance, but there is little evidence to support this in the scientific literature.

NUTRITIONAL SUPPLEMENTS: ENERGY DRINKS

- Caffein: up to 400 mg/day without adverse effects (individualization!)
- Adverse effects: nervousness, irritability, sleeplessness, increased urination, abnormal heart rhythms, and dyspepsia.
- Bupropion, caffeine, nicotine, phenylephrine, phenylpropanolamine, pipradol and synephrine: These substances are included in the 2016 WADA Monitoring Program, and are not considered Prohibited Substances (In-Competition only!).
- Excessive or repeated consumption of energy drinks can lead to cardiac problems, such as arrhythmias and heart attacks, and psychiatric conditions such as anxiety and phobias.
- In Europe, energy drinks containing taurine and caffeine have been associated with the deaths of athletes.

NUTRITIONAL SUPPLEMENTS: SPORTS DRINKS

Sports drinks

- Beverages whose stated purpose is to help athletes replace water, electrolytes, and energy after training or competition, though their efficacy for that purpose has been questioned, particularly after exercise.

- Three major types:

a) Isotonic sport drinks contain similar concentrations of salt and sugar as in the human body.

b) Hypertonic sport drinks contain a higher concentration of salt and sugar than the human body.

c) Hypotonic sport drinks contain a lower concentration of salt and sugar than the human body.

- Most sports drinks are approximately isotonic, having between 4 and 5 heaped teaspoons of sugar per five ounce (13 and 19 grams per 250ml) serving.

NUTRITIONAL SUPPLEMENTS: SPORTS DRINKS

Sports drinks - do we really need them?

- Robert Robergs (an exercise physiologist at the University of New Mexico who studied Gatorade) - unless someone is exercising or competing in a sporting event for longer than 90 minutes, there is no reason to drink something with excess sugar and electrolytes.

- The Australian Institute of Sport: excessive salt supplementation during exercise may lead to "gastrointestinal problems or cause further impairment of fluid balance" and may cause salt-induced cramps.

- Stated purpose of sports drinks, which provide many calories of energy from sugars, is to improve performance and endurance:

a) Matthew Thompson and colleagues from the Oxford Centre for Evidence Based Medicine: for the vast majority of people, drinking such products "could completely counteract exercising more, playing football more, going to the gym more“.

CHOOSE WISELY!!!