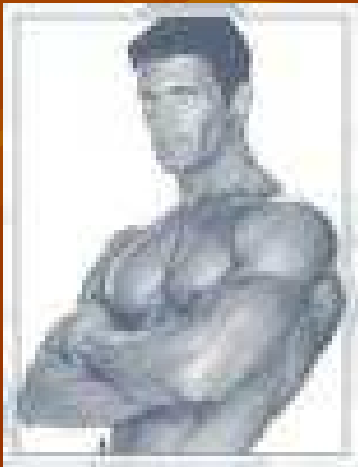




Sport „nutritional“ supplements

Are they save ?
Do they work ?



Ergogenic aids

- Any substances/method (legal or illegal) designed to enhance exercise performance
- Six general categories:
 - Mechanical
 - Psychological
 - Pharmacological
 - Hormonal
 - Physiological
 - Nutritional

Definition

- **Dietary supplement (DSHEA, 1994)**



- product taken by mouth that contains a dietary ingredient intended to supplement diet
- Dietary ingredients: vitamins, minerals, herbs or other botanicals, amino acids, substances such as enzymes, organ tissues, glandular substances, metabolites
- Tablets, powders, capsules, softgels, gelcaps, liquids, bars, juices
- The most popular - protein powder, amino acids, (multi)vitamins, (multi)minerals, creatine, L-Carnitine, HMB, DHEA, inosine,

- Definitions differ between countries

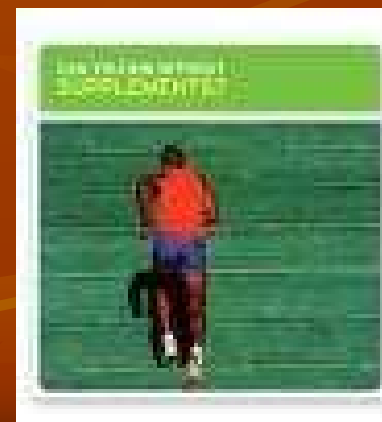
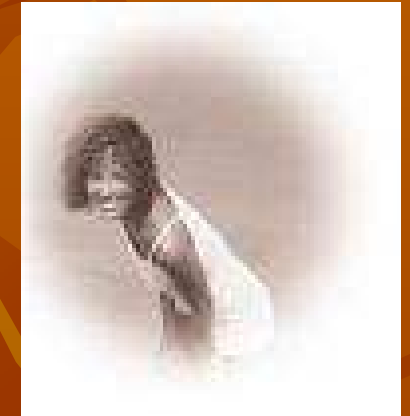
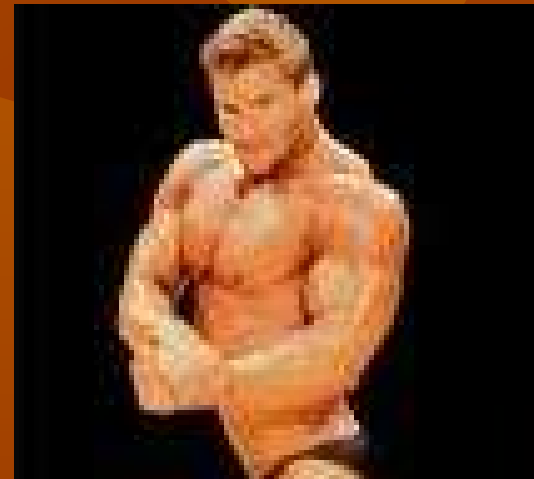


Control, registration and regulation

- Situation in the Czech Republic
 - **Ministry of health** - doses and restriction (children and pregnant)
 - **No control** - contents and label !!!!
 - National institute of public health
 - Reference about health safety
 - Laboratory with accreditation
 - Laboratory examination
 - USA - DSHEA - label, CFSAN
 - Australia - FSANZ, TGA
- *Supplements are not drug !!!*

Potencial benefits

- Sport nutritional supplements
 - Prolong endurance
 - Reduce body fat
 - Increase body mass
 - Enhance recovery
 - Minimize the risk of illness
 - Enhance physical and mental ability



Who take supplements?

- Athletes 50 %
- Elite athletes 60 %
- General population 35 - 40 %
- **Research at our faculty**
 - 100 students - 36 elite athletes, 64 recreational athletes
 - 75 % of elite athletes
 - 23 % of recreational athletes
- Prevalence and used types of supplements vary with:
 - The nature of sport
 - The sex of the athletes
 - The level of competition

Is it worth taking supplements?

- What is the physiological basis or theory for product's action? **EFFECT**
- Are there any scientific studies that support or refute the claims that the product makes?
- Are there any side effects, any potentially serious adverse effects? **SAFETY**
- Is the product legal?

Safety

- Comprehensive evaluation - only a few supplements
- Limited research - the most supplements
- Contents of toxic or prohibited ingredients (anabolic steroids, strychnine, ephedrine)
 - Poor manufacturing practice
 - Deliberate adulteration
- Absence of effective ingredients
- Mega doses of supplement - „if a little is good, a lot must be better“
 - Vitamin A - liver and bone damage, teratogenicity in pregnancy
 - Vitamin B6 - neurological symptoms
 - Folic acid - mask a deficiency of B12
 - BCAA -problems similar to excessive protein intake
- Prolonged period of supplementation
 - Creatine, glutamine



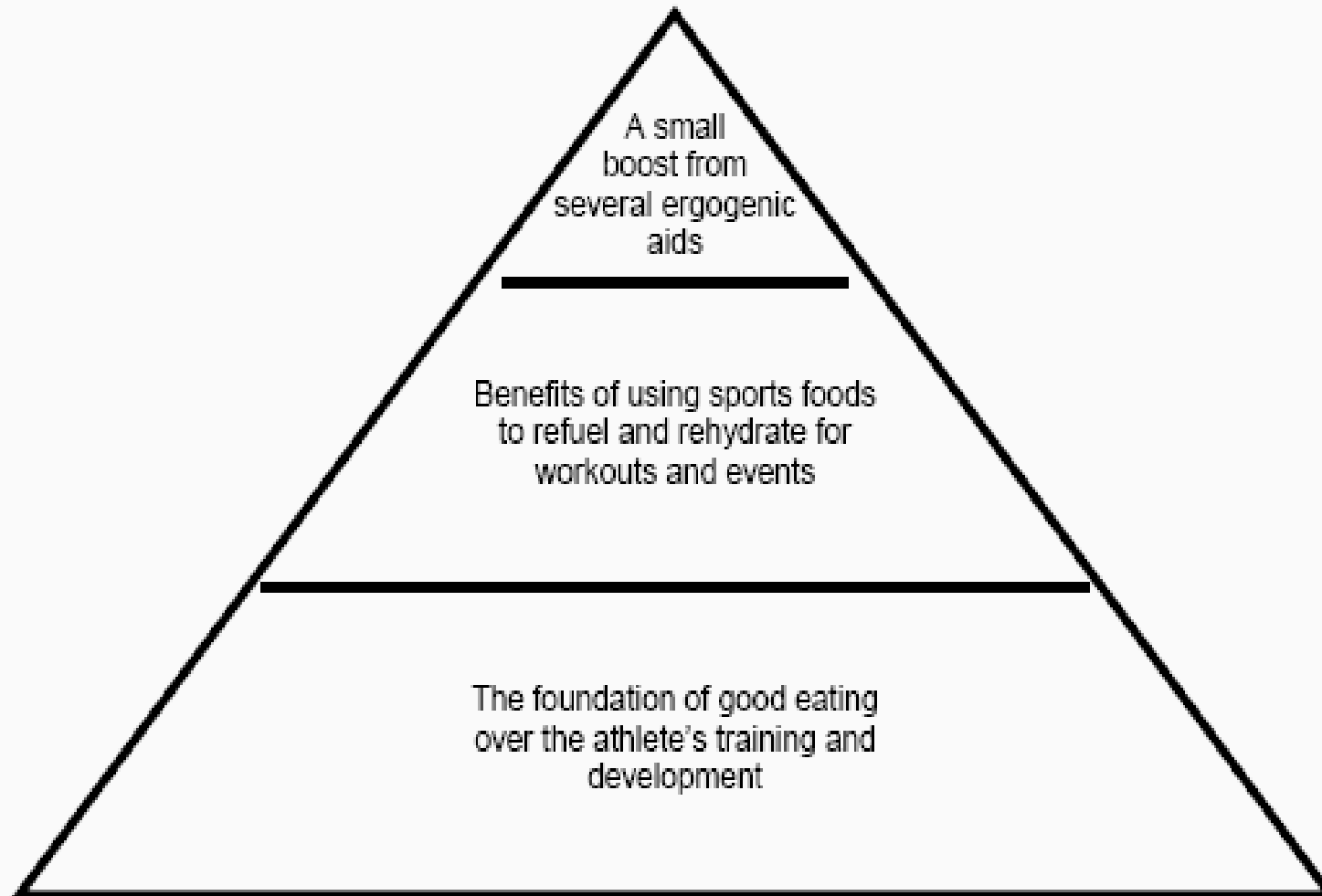
Effect

- The most supplements that offer a direct performance enhancing effect - **against the rule of sport** - drugs, hormones
- The most legal substances - not effective - vitamin and mineral supplements
- **Certificate of health safety \neq certificate of effect**
- **Bioavailability**
- **Placebo effect**

Classification system of supplement according to AIS

Supplement Grouping	A	B	C	D
Definition	Supported for use by AIS athletes	Considered for provision to AIS athletes only under a research protocol	Supplements which have no proof of beneficial effects and are therefore not to be provided to official AIS programs	These supplements should not be used by AIS athletes
Examples	antioxidants bicarbonate caffeine ⁺ calcium creatine electrolyte replacement glycerol iron liquid meal supplements multivitamin/mineral sick pack (vit. C and Zn) sports bars sports drink sports gels * Caffeine is not provided to AIS athletes	colostrum glutamine HMB ribose	branched chain amino acids & other free-from amino acids carnitine chromium picolinate coenzyme Q10 cordyceps cytochrome C gamma-oryzanol & ferulic acid ginseng inosine nitrous oxide supplements oxygen boosters pyruvate rhodiola rosea vitamin B12 all network marketing supplements including Neways, Nuskin (IDN), Usana, Mannatech, Herbalife, Juice Plus, Noni Juice, Gogi Juice	androstenedione 19-norandrostenediol 19-norandrostenedione DHEA ephedra strychnine tribulus terrestris & other herbal testosterone supplements

Athlete pyramid



Help for athletes

- Education: coaches, athletes, trainers and their sport/science staff
- Develop program for athletes to distinguish the level of risk
- Produce of high-quality well label sport supplements
- Stop to excuse athletes who claim that their positive tests are the result of supplement use