



Doping & Suplemen

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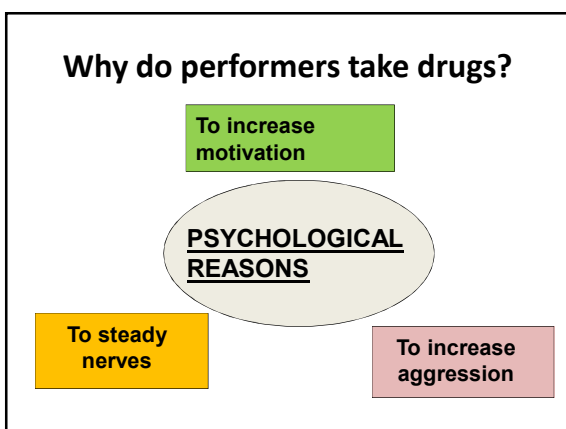
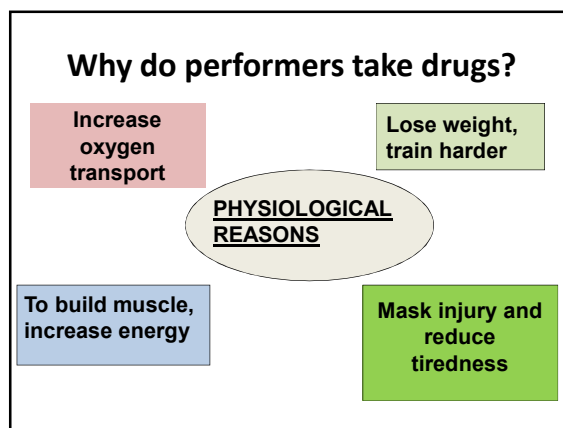
DOPING

Pengertian: pelanggaran satu atau lebih peraturan anti doping dlm ps 2.1 sampai pasal 2.8 Code Anti Doping Dunia:

- Terdapat zat terlarang dlm sampel atlet
- Menggunakan, memiliki, dan memperdagangkan zat atau metode terlarang
- Menolak menyerahkan sampel
- Menolak diuji di luar kompetisi
- Merusak bag.pengawasan doping

MENGAPA DOPING DILARANG?

- Bertentangan dg semangat Olahraga
- Melanggar etika, medis, dan gerakan Olimpiade
- Ancaman bagi kesehatan atlet
- Melanggar peraturan.



Why shouldn't they take drugs?

MORAL REASONS

- Gives an unfair advantage
- Undermines the true spirit of sport
- Reflects badly on others

LEGAL REASONS

- Against the law of the land
- Against the law of sports

Why shouldn't they take drugs?

ROLE MODELLING

- Gives a bad example to others, especially young people who copy their heroes and put their lives at risk
- Gives a bad image to sport and lowers its status

ZAT TERLARANG

- Anabolic agent
- Hormon dan zat terkait
- Beta-2-Agonist
- Antagonis dan Modulator Hormon
- Diuretik dan *Masking Agent* lain

METODE TERLARANG

- Meningkatkan Transfer Oksigen
- Manipulasi Kimiawi dan Fisik
- Doping Gen

Zat & Metode Terlarang dlm Kompetisi

- Stimulant
- Narkotika
- Cannabiods
- Glucocorticosteroids
- Dalam OR tertentu: Alkohol dan Beta Blocker

Therapeutic Use Exemptions

- Athletes, like all others, may have illnesses or conditions that require them to take particular medications.
- If the medication an athlete is required to take to treat an illness or condition happens to fall under the Prohibited List, a Therapeutic Use Exemption may give that athlete the authorization to take the needed medicine.

What are the criteria for granting a TUE?

The criteria are:

- The athlete would experience significant health problems without taking the prohibited substance or method,
- The therapeutic use of the substance would not produce significant enhancement of performance, and
- There is no reasonable therapeutic alternative to the use of the otherwise prohibited substance or method.

SUPLEMEN



Supplements

- Supplements can present a high risk for several reasons:
 - They do not fall under the same regulations as food and medicines. This means they do not have to state all their ingredients on the label, so you may not know what you're taking
 - Advertising of supplements can suggest untested claims about their benefits
 - Production of some supplements has low quality control, which means that there is a chance of contamination with other products that may be banned substances.

Suplemen

- Diet, lifestyle and training should all be optimised before considering supplements.
 - Athletes should assess the need for supplements by consulting an accredited sports dietician, registered nutritionist with expertise in sports nutrition, or a sports and exercise medicine doctor, before taking supplements.

Definisi Zat Ergogenik

- Zat Ergogenik: bahan-bahan yg dpt membantu meningkatkan *performance* atlet.
- Penggunaan suplemen: *overused & misused*, bahkan toksik.
- Banyak uang yg dibelanjakan utk pembelian suplemen yg tidak perlu.
- Banyak sekali produk yg ditawarkan (pil, bubuk, minuman, dll).

Antioksidan: What is it?

- Substansi yg dpt mengatasi radikal bebas
- Enzim, vitamin, mineral, phytochemical
- Klaim:
 1. mengurangi gejala/risiko yg terkait dg banyaknya radikal bebas yg terbentuk akibat exercise.
 2. Melindungi thd penyakit akibat penuaan
 3. *anti-aging*

Fakta ttg Antioksidan

- Riset penggunaan antioksidan pd atlet memberikan hasil yg bervariasi.
- Riset: antioksidan dlm bentuk campuran (multivitamin) memberikan manfaat yg lebih baik selama latihan intensitas tinggi.
- Hati-hati: riset biasanya utk penggunaan jangka pendek. Utk penggunaan jangka panjang blm cukup informasi ttg hal tsb.

SUPLEMEN PROTEIN



What is it ?

- Bisa berupa bubuk yg dicampur ke susu atau air atau berupa protein batangan.
- Sebagian besar berupa protein susu
- Klaim: dapat menstimulasi sistem imun, mencegah menurunnya sistem imun akibat latihan berat.
- Dosis: 30-60 mg (1x sehari).

Apakah ada efek samping?

- Protein yg berlebihan berefek buruk & tidak bermanfaat (2-3x sehari) → efek ke ginjal.
- Harga mahal

L-Carnitin: What Is It?

- Asam karboksilat rantai pendek, yg dlm tubuh dibentuk dari asam amino lisin & metionin.
- Klaim: meningkatkan *aerobic power* & energi, menurunkan lemak tubuh.
- Fakta: tidak ada efek ergogenik stlh pemberian L-carnitin (4 g selama 7 hari) dg lat anaerob intensitas tinggi → hanya meningkatkan kadar serum carnitin.
- Dosis besar: diare

Riset

- 13 penelitian:
 - 9 penelitian → tdk ada efek suplementasi L-carnitin dlm meningkatkan kadar asam lemak, meningkatkan VO₂max atau meningkatkan performance.
 - 4 penelitian menunjukkan manfaat ergogenik L-carnitin

Kafein



- Stimulan
- Klaim: meningkatkan kewaspadaan, konsentrasi, & endurance
- Siapa yg mendpt keuntungan dari kafein? Atlet yg bermain dlm intensitas tinggi, waktu yg singkat & endurance.
- Efek samping: kecemasan, gangg.tidur.
- Efek diuretik → dehidrasi.

Apakah Kafein Legal?

- Dosis yg diperbolehkan: tidak lebih dr 12 mcg/ml dlm urin (8 cangkir kopi).
- Pada tahun 2008 Kafein tidak masuk doping, namun masuk dalam program pemantauan

CREATIN MONOHYDRATE: Klaim

- Meningkatkan kekuatan otot
- Memperbesar otot
- Membantu membakar lemak
- Meningkatkan daya tahan & menunda kelelahan

Creatin: What is it?



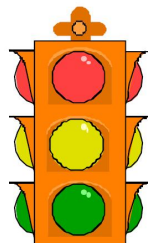
- Salah satu komponen dlm sumber makanan tinggi protein, spt daging merah.
- Secara endogen dibentuk dari asam amino glisin, arginin, & metionin oleh hati, ginjal, & pancreas.
- 95% creatin disimpan di otot skelet; 5% di jantung, otak, & testis.

Creatin: Fakta

- Bbrp studi memperlihatkan efek jk.pendek suplementasi creatin dalam aktivitas yg membutuhkan kekuatan & power (*knee extension, bench press, cycling sprint*).
- Suplementasi creatin tdk berdampak pada aktivitas endurans.

Hal-hal yg harus diperhatikan

- Safety
- Efficacy
- Potency
- Legality



Cara yg paling efektif

- Latihan yg efisien &
- Nutrisi yg optimal



TABLE 11.1

Selected Nutrition Supplements, Product Claims, and Supporting Scientific Evidence

Ergogenic aids	Description	Claim	Scientific evidence
Androstenedione	Synthetic product to stimulate testosterone synthesis	Increases testosterone, increases muscle mass, and improves recovery	Does not increase testosterone; has no effect on strength
Bee pollen	Mixture of bee saliva, plant nectar, and pollen	Increases energy levels, enhances physical fitness, improves endurance, and boosts immune function	No supporting evidence
Beta-hydroxy beta methylbutyrate (HMB)	Metabolite of the essential amino acid leucine	Decreases protein breakdown, improves muscle mass, and increases strength	Possible small effects on lean body mass and strength
Boron	Trace element present in vegetables and noncitrus fruits	Improves bone density, muscle mass, and strength	Improves bone mineral density in postmenopausal women; no effect on bone density, muscle mass, or strength in men
Caffeine	Substance found in coffee and chocolate	Increases performance and alertness	Improves performance in most events, except short high-intensity sprints; increases cognitive functioning during exercise
Carnitine	Vitamin-like substance important for FA transport	Improves fat oxidation, helps weight loss, and improves VO ₂ max	Not taken up by muscle and therefore not effective
Choline	Precursor of the neurotransmitter acetylcholine	Improves performance and decreases fatigue	No supporting evidence
Chromium picolinate	Trace element that potentiates insulin action	Builds muscle and helps weight loss	No supporting evidence
Coenzyme Q10	Part of the electron-transport chain in the mitochondria	Improves VO ₂ max, improves performance, reduces fatigue	No supporting evidence
Creatine	High-energy phosphate carrier important for direct energy	Improves strength, reduces fatigue, and increases protein synthesis	Improves performance in sprints and repeated sprints; Doubtful: improves recovery between bouts; anabolic? Properties unclear
DHEA	A precursor of testosterone and estradiol	Improves immune function, increases BMAPs, protects against cardiovascular disease, increases lean body mass, and increases well-being	Some evidence in humans
Dihydroxyacetone	An intermediate of carbohydrate metabolism used in combination with pyruvate	Facilitates carbohydrate and fat metabolism and improves performance	Limited supporting evidence
Fish oil	Polyunsaturated fatty acids	Increases VO ₂ max	No supporting evidence

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TABLE 11.1 (CONTINUED)

Ergogenic aids	Description	Claim	Scientific evidence
Ginseng	Root of the <i>Araliaceae</i> plant	Improves strength, performance, stamina, and cognitive functioning; reduces fatigue	No supporting evidence, but studies poorly designed
Glutamine	An amino acid	Improves immune function, muscle glycogen resynthesis, recovery, and endurance	Does not affect immune function; possibly affects muscle glycogen resynthesis
Glandulars	Extracts of animal glands	Improves strength, performance, and stamina	No supporting evidence
Glycerol	Backbone of a triacylglycerol molecule	Induces hyperhydration, decreases legal stress, and improves performance	Induces hyperhydration and decreases legal stress during exercise; effects on performance unclear
Inosine	Nucleoside	Increases ATP stores, improves strength, training quality, and performance	No supporting evidence
Lecithin	Phosphatidylcholine	Increases VO ₂ max and performance	No supporting evidence
Medium-chain triacylglycerols (MCT)	Synthesized from coconut oil	Supplies energy, reduces muscle glycogen breakdown, and improves performance	No supporting evidence
Pangamic acid (Vitamin B ₁₂)	Varied composition depending on supplier	Increases oxygen delivery	No supporting evidence
Phosphate salts	Mineral	Increases ATP, provides energy, and buffers lactic acid	Possible ergogenic effects; improves performance in events 1 hour or shorter
Phosphatidylserine	Structural component of cell membranes	Reduces stress response and improves recovery	Little supporting evidence
Polylactate	Polymer of lactate	Provides energy	No effects on performance
Pyruvate	An intermediate of carbohydrate metabolism	Improves endurance capacity, insulin sensitivity, and recovery; increases glycogen storage	Limited supporting evidence
Sodium bicarbonate	Buffer present in blood	Buffers lactic acid and improves high-intensity exercise performance	Improves high-intensity exercise performance
Sodium citrate	Buffer	Buffers lactic acid and improves high-intensity exercise performance	Can improve performance with larger doses
Sodium	Trace element	Helps weight loss, improves insulin sensitivity and recovery	Increases insulin sensitivity in diabetes with insulin resistance; studies in healthy individuals lacking
Yohimbine	α_2 -adrenoceptor blocker	Increases testosterone, increases fat-free mass, and improves strength	No supporting evidence
Wheat germ oil	Extracted from embryo of wheat	Improves endurance	No supporting evidence

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