Food supplements

Danger for doping contamination?

FISA
Fédération Internationale des Sociétés d'Aviron
International Rowing Federation

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Campeonatos del Mundo de Remo FISA
FISA World Rowing Championships

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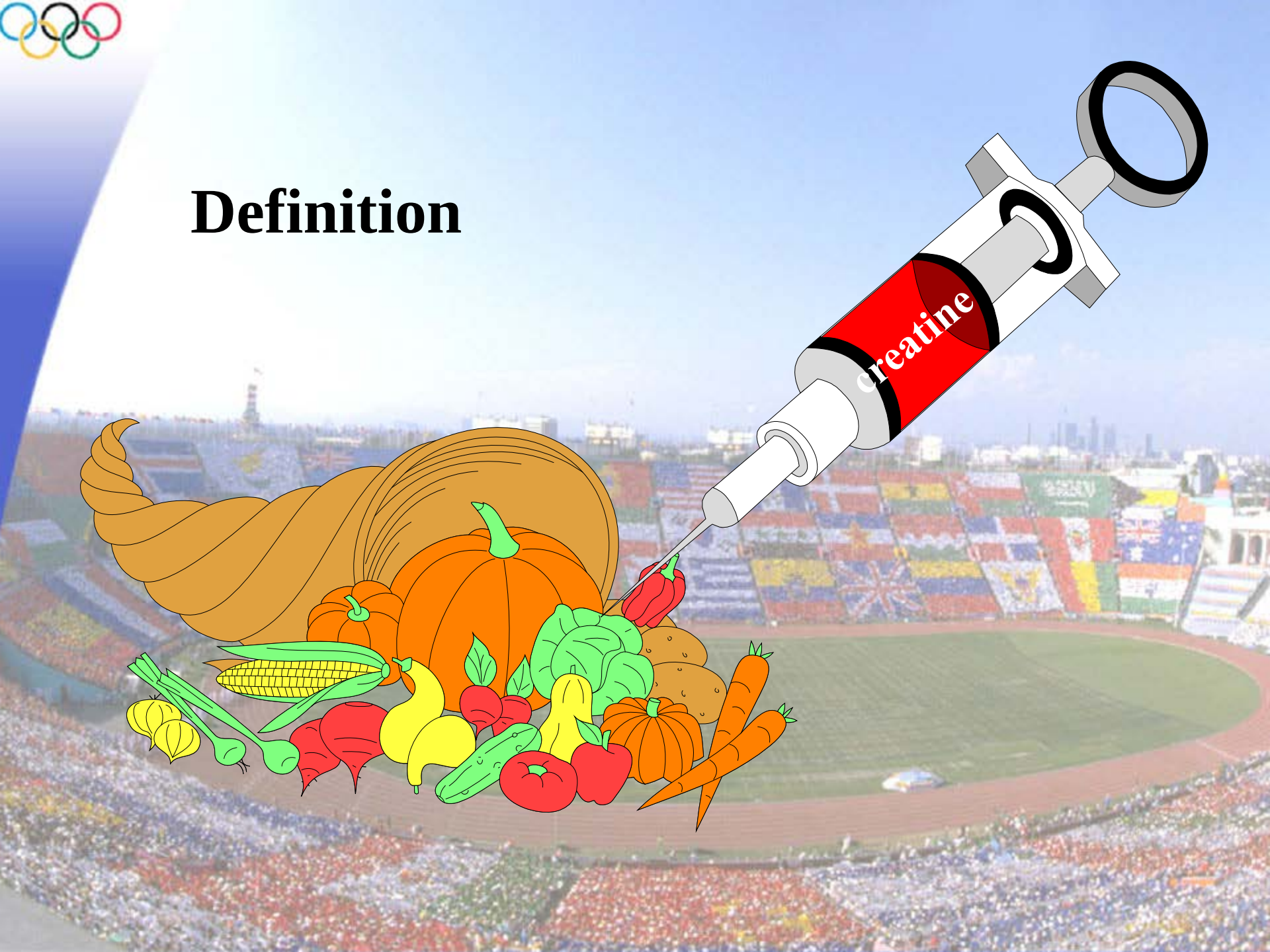
The history of food supplements came to the surface about 5 years ago.One of the first case of contamination related appeared in Israel in 1998 with a product as Tribulus

Before that, they have been used by specific classes of people who belonged either to some specific communities as bodybuildes, or other communities claiming and praising the use of “natural” products

The approximate budget of this market is in 2000, 4.5billion US$

Most of the presentation will be related to USA as 80% of the food supplements come from USA or are manufactured under US patent.

Definition

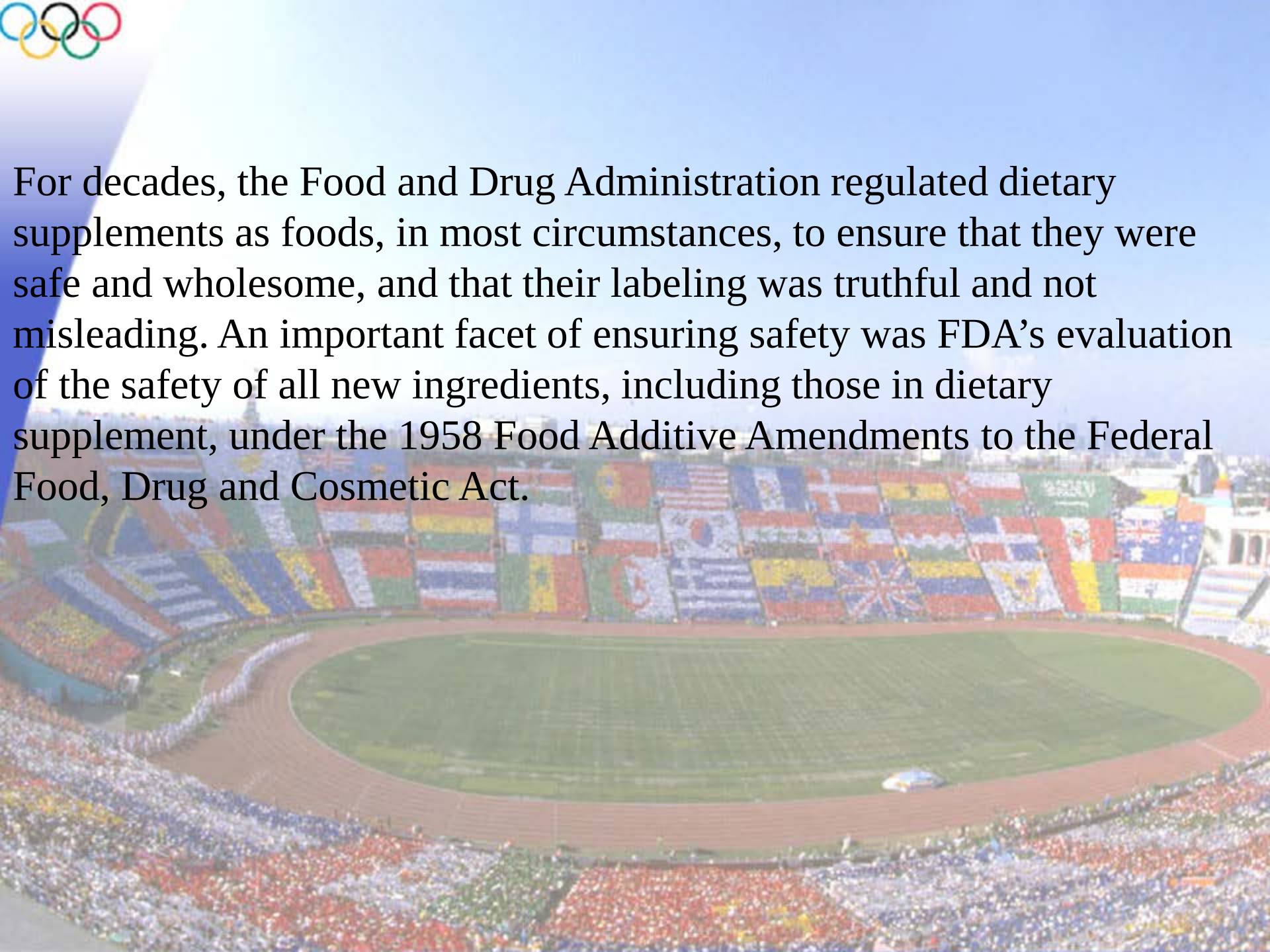


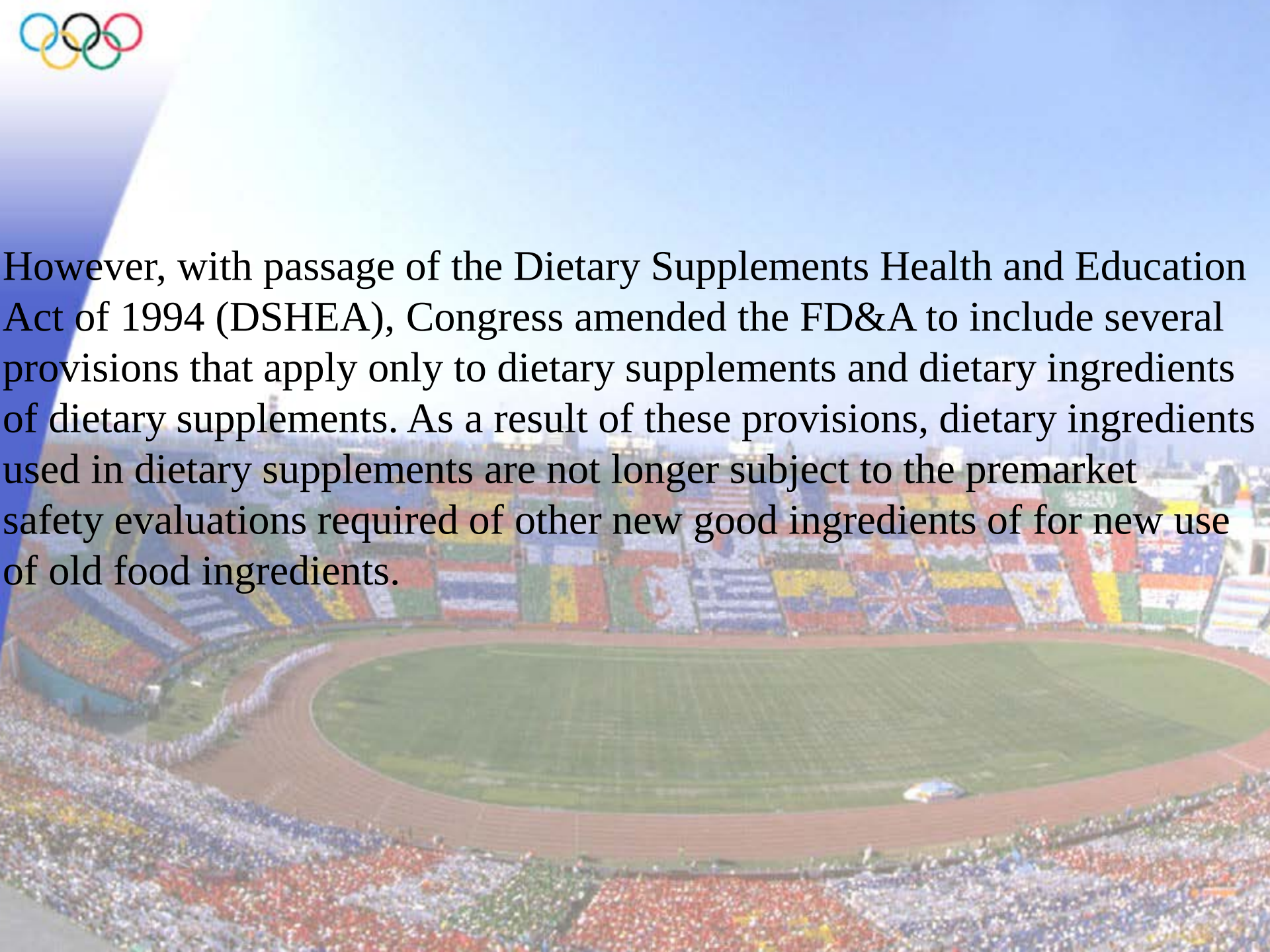
Definition of a dietary supplement

FDA traditionally considered dietary supplements to be composed of essential nutrients, such as vitamins, minerals and proteins.

The Nutrition Labelling Act of 1990 added « herbs, or similar nutritional substances » to the term « dietary supplement »

For decades, the Food and Drug Administration regulated dietary supplements as foods, in most circumstances, to ensure that they were safe and wholesome, and that their labeling was truthful and not misleading. An important facet of ensuring safety was FDA's evaluation of the safety of all new ingredients, including those in dietary supplement, under the 1958 Food Additive Amendments to the Federal Food, Drug and Cosmetic Act.





However, with passage of the Dietary Supplements Health and Education Act of 1994 (DSHEA), Congress amended the FD&A to include several provisions that apply only to dietary supplements and dietary ingredients of dietary supplements. As a result of these provisions, dietary ingredients used in dietary supplements are not longer subject to the premarket safety evaluations required of other new good ingredients of for new use of old food ingredients.

DSHEA's definition of a dietary supplements

A dietary supplement :

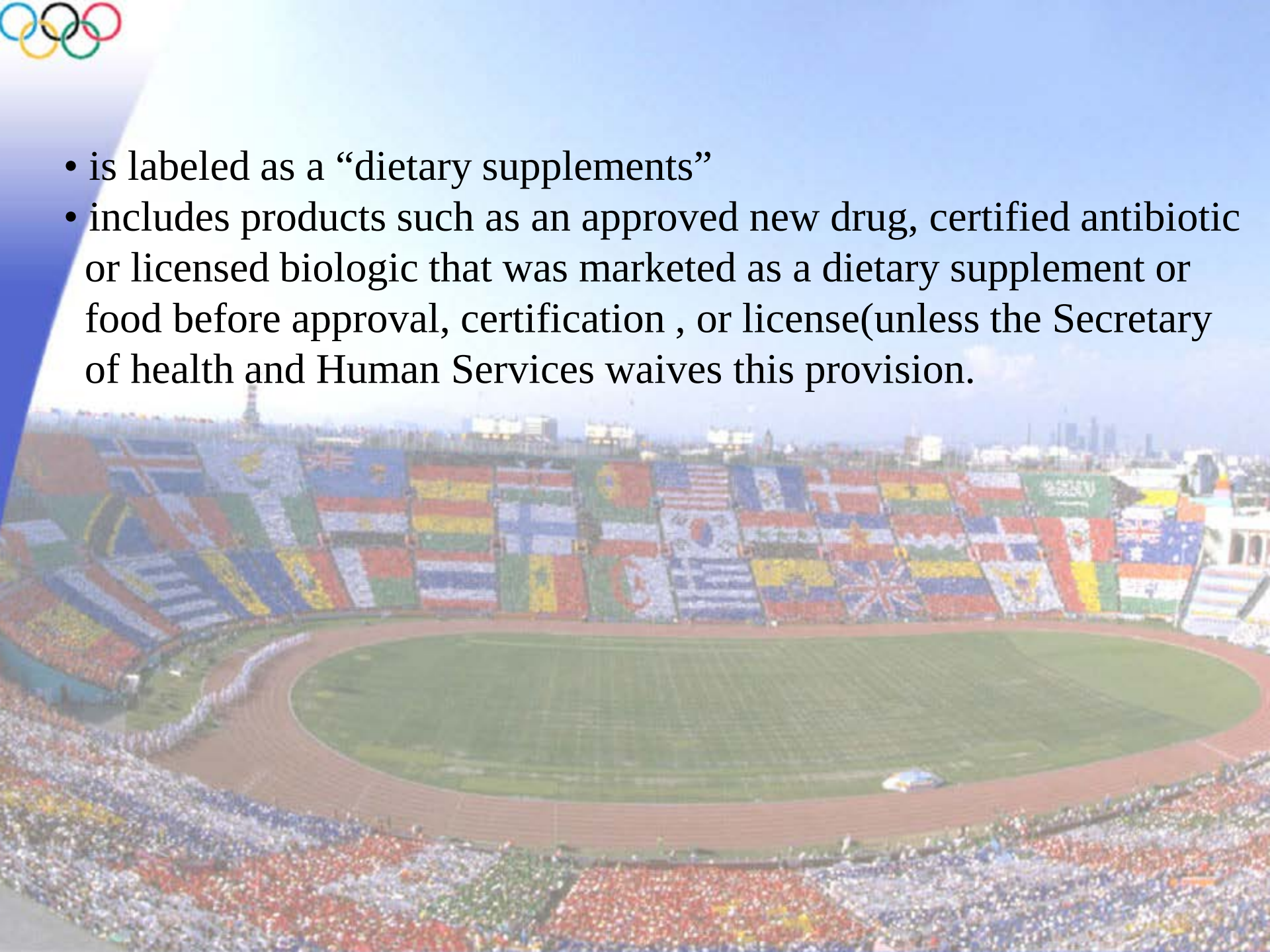
- is a product(other than tobacco) that is intended to supplement diet that bears or contains one or more of the following dietary ingredients :

  a vitamin, a mineral, an herh or other botanical, an amino acid, a dietary substance for use by man or a concentrate, metabolite, extract, or combinations of these ingredients.

- is intended for ingestion in pill, capsule, tablet or liquid form

- is not represented for use as a conventional food or as the sole item of a meal or diet

- is labeled as a “dietary supplements”
- includes products such as an approved new drug, certified antibiotic or licensed biologic that was marketed as a dietary supplement or food before approval, certification , or license(unless the Secretary of health and Human Services waives this provision.



What is a "new dietary ingredient" in a dietary supplement?

The Dietary Supplement Health and Education Act (DSHEA) of 1994 defined both of the terms "dietary ingredient" and "new dietary ingredient”as components of dietary supplements.
In order for an ingredient of a dietary supplement to be a "dietary ingredient," it must be one or any combination of the following substances:

a vitamin,
a mineral,
an herb or other botanical,
an amino acid,

A "new dietary ingredient" is one that meets the above definition for a "dietary ingredient" and was not sold in the U.S. in a dietary supplement before October 15,1994.

What is FDA's role in regulating dietary supplements versus the manufacturer's responsibility for marketing them?

In October 1994, the Dietary Supplement Health and Education Act (DSHEA) was signed into law by President Clinton. Before this time, dietary supplements were subject to the same regulatory requirements as were other foods. This new law, which amended the Federal Food, Drug, and Cosmetic Act, created a new regulatory framework for the safety and labeling of dietary supplements.

Under DSHEA, a firm is responsible for determining that the dietary supplements it manufactures or distributes are safe and that any representations or claims made about them are substantiated by adequate evidence to show that they are not false or misleading. **This means that dietary supplements do not need approval from FDA before they are marketed.**

Except in the case of a new dietary ingredient, where pre-market review for safety data and other information is required by law, a firm does not have to provide FDA with the evidence it relies on to substantiate safety or effectiveness before or after it markets its products.

Also, manufacturers do not need to register themselves nor their dietary supplement products with FDA before producing or selling them. Currently, there are no FDA regulations that are specific to dietary supplements that establish a minimum standard of practice for manufacturing dietary supplements. However, FDA intends to issue regulations on good manufacturing practices that will focus on practices that ensure the identity, purity, quality, strength and composition of dietary supplements. At present, the manufacturer is responsible for establishing its own manufacturing practice guidelines to ensure that the dietary supplements it produces are safe and contain the ingredients listed on the label.

Definition for the European Community

*Food supplements can be **concentrated sources of a single nutrient** or a combination of several nutrients, whose essential purpose is to supplement the intake of particular nutrients in the daily diet.*

Vitamin and mineral supplements as discussed in this position derive their nutritional relevance primarily from the vitamins and minerals they contain.
A second category of food supplements is natural products, containing nutrients and/or non-nutrients.
They are marketed principally for their “health maintaining” properties, for example **natural extracts** such as ginseng, lecithin, and fish liver oil, phytochemicals, and in some countries amino acids.

Labeling ?

What information must the manufacturer disclose on the label of a dietary supplement?

FDA regulations require that certain information appear on dietary supplement labels. Information that must be on a dietary supplement label includes: a descriptive name of the product stating that it is a "supplement;" the name and place of business of the manufacturer, packer, or distributor; a complete list of ingredients; and the net contents of the product.

In addition, each dietary supplement (except for some small volume products or those produced by eligible small businesses) must have nutrition labeling in the form of a "Supplement Facts" panel. This label must identify each dietary ingredient contained in the product.

Must all ingredients be declared on the label of a dietary supplement?

Yes, ingredients not listed on the "Supplement Facts" panel must be listed in the "other ingredient" statement beneath the panel. The types of ingredients listed there could include the source of dietary ingredients, if not identified in the "Supplement Facts" panel (e.g., rose hips as the source of vitamin C), other food ingredients (e.g., water and sugar), and technical additives or processing aids (e.g., gelatin, starch, colors, stabilizers, preservatives, and flavors)

Labelling of food supplements

↓ All existing horizontal EU legislation concerning the labelling of foodstuffs should apply to food supplements.

↓ Information on vitamins and minerals should be given per consumption unit.

↓ If necessary a warning should be given.

↓ Active substances must be given in standardised quantities to allow the consumer to compare products.

↓ For food supplements other than vitamins, minerals and trace elements the active substance must be declared quantitatively.

↓Information on the level of active ingredients and their origin needs to be provided.

↓ it is necessary to set criteria for strength and potency claims
↓ It is necessary to clearly state any specific advice for vulnerable groups, which need to be defined.
↓ Guidance for safe usage must be provided.
↓ Nutrition information should be presented in a standard format on all products enabling consumers to make comparisons easily.
↓ The same units and abbreviations should be used on all products.
↓ All products should carry a statement to the effect that the product is “no substitute for a balanced, varied diet” and when appropriate “if you have a medical condition, consult your doctor”.

N·R·G Nature's Raw Guarana

In today's fast-paced world we can easily get overextended. The first remedy for this is good nutrition and plenty of rest. But when you need that extra boost, **the company** has captured the qualities of guarana in its N•R•G tablets and tea.* Its essence is derived from the same guarana source used for centuries by the Amazon Indians. This gentle, natural herb will give you all the spirited and refreshing attributes you'll need to improve your day.*

N•R•G tea has a delicious citrus flavor that can be made instantly at home, work or anywhere. Enjoy hot or cold, twice a day, for a refreshing treat.

For your best performance, use N•R•G tablets two to four times a da

Guarana

Today,Brazilians minors drink beverages containing Guarana because it brings a great feeling of natural energy.

The company has captured the exceptional properties of Guarana in its Guarana tablets. Great tonic effect.

Each tablet contains between 10 and 14 mg of caffeine.

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Responsibility ?

Who has the responsibility for ensuring that a dietary supplement is safe?

By law (DSHEA), the manufacturer is responsible for ensuring that its dietary supplement products are safe before they are marketed. Unlike drug products that must be proven safe and effective for their intended use before marketing, there are no provisions in the law for FDA to "approve" dietary supplements for safety or effectiveness before they reach the consumer. Also unlike drug products, manufacturers and distributors of dietary supplements are not currently required by law to record, investigate or forward to FDA any reports they receive of injuries or illnesses that may be related to the use of their products.

Under DSHEA, once the product is marketed, FDA has the responsibility for showing that a dietary supplement is "unsafe," before it can take action to restrict the product's use or removal from the marketplace.

Does FDA routinely analyze the content of dietary supplements?

In that FDA has limited resources to analyze the composition of food products, including dietary supplements, it focuses these resources first on public health emergencies and products that may have caused injury or illness.

The agency does not analyze dietary supplements before they are sold to consumers. **The manufacturer is responsible** for ensuring that the "Supplement Facts" label and ingredient list are accurate, that the dietary ingredients are safe, and that the content matches the amount declared on the label.

FDA does not have resources to analyze dietary supplements sent to the agency by consumers who want to know their content. Instead, consumers may contact the manufacturer or a commercial laboratory for an analysis of the content.

Maximum limits - the health risk

- **The fixing of maximum limits for vitamins and minerals in food supplements should depend on risk assessments on upper safe intake levels to be established by the Scientific Committee for food.**
- **Intakes from all sources should be taken into consideration as well as possible interaction between nutrients.**
- **For vitamins and minerals with a narrow safety margin between the recommended daily intake and the adverse effect level, different limits for the daily dose, which could be done at national level, should be established.**

This whole process must be open and transparent and must gain the wide agreement of stakeholders ,including consumer groups.

Safety of food supplements

It is important to apply a precautionary approach, and to invoke the precautionary principle to set up a quick procedure, enforced by the competent national authority, to ban food supplements or substances from being marketed if their use could cause damage to health. The rulings resulting from this procedure will enable food inspectors to intervene.

Purity criteria for supplements derived from natural substances

↖ Purity criteria must be established for the ingredients of food supplements.

↓ Providing sufficient toxicological data is available, maximum levels for natural components should be laid down by law.

↓ Research should be undertaken to collect toxicological information on natural components in foodstuffs, e.g. food supplements.

Good Manufacturing Practice (GMP)

↓ **EU-wide guidelines for good hygienic practices must be developed.**

↓ **Producers should be encouraged to produce monographs for food supplements derived from natural components.**

What have you done ?

How do I, my health care provider, or any informed individual report a problem or illness caused by a dietary supplement to FDA?

If you think you have suffered a **serious harmful effect** or illness from a product FDA regulates, including dietary supplements, the first thing you should do is contact or see your healthcare provider immediately. Then, you and your health care provider are encouraged to report this problem to FDA.

Your health care provider can call FDA's MedWatch hotline at 1-800-FDA-1088, submit a report by fax to 1-800-FDA-0178 or on-line at: **http://www.fda.gov/medwatch/report/hcp.htm**. The MedWatch program provides a way for health care providers to report problems believed to be caused by FDA-regulated products such as drugs, medical devices, medical foods and dietary supplements.

It is clear that the European legislation is far more stringent that the US one.

However, due to the incredible development of the emarket on Internet, national rules can be easily bypassed.

Therefore, the same advice should be provided to everyone.

It is noted also that since1 year, the US administration has started to move toward the right direction and to try to correct some negative aspects of the DHSEA.

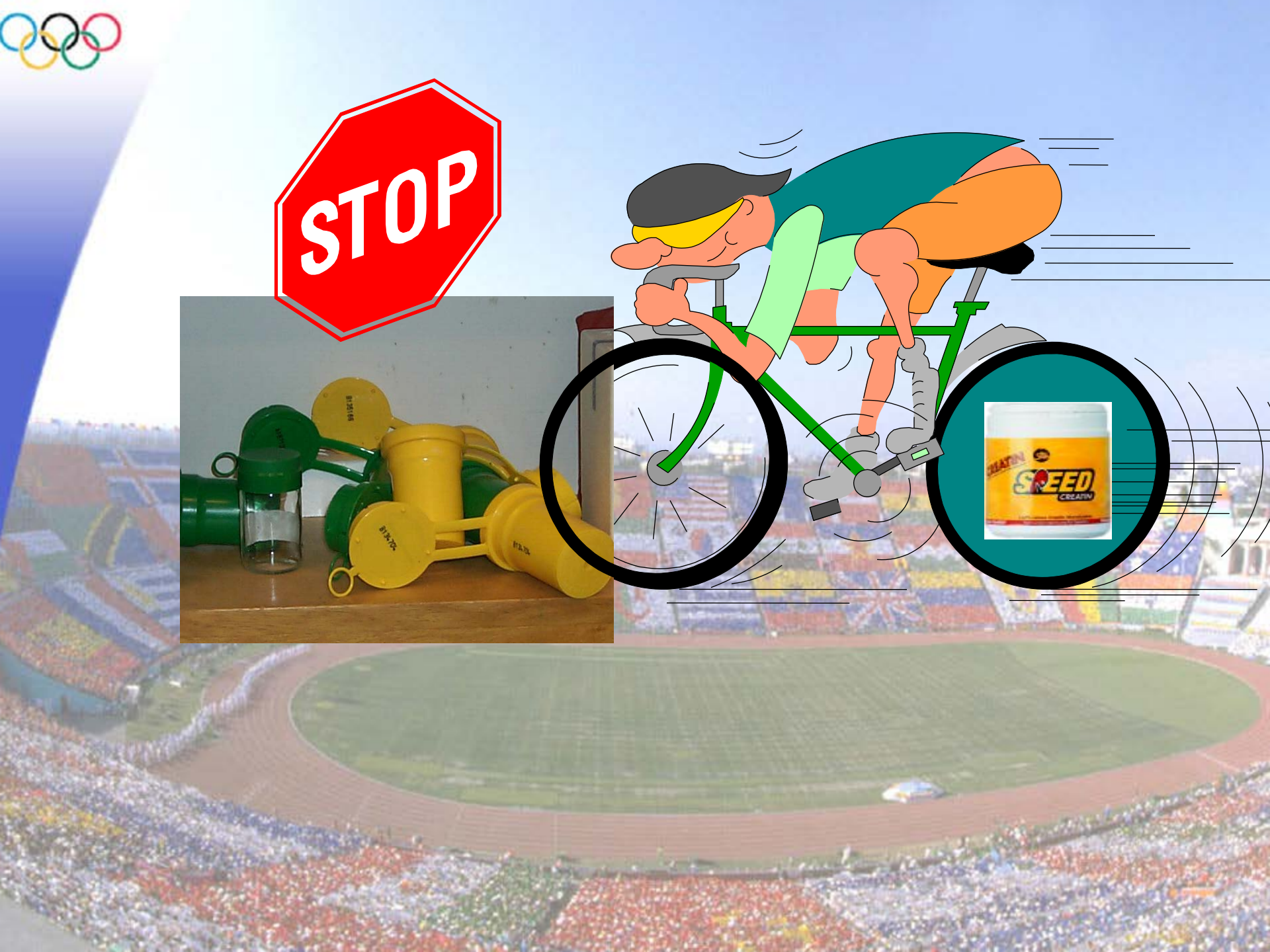
For the first time, late August 2002, an athlete has sued a food supplement company for having caused a positive result

Wide and serious problem

Where is the problem ?

These dietary supplements are largely taken by athletes for different reasons such as :

- lack of reliable nutrition program
- confidence in friends or coaches advises
- hope to achieve more with less work
- self treatment


STOP
SPEED

What are the risks?

- An athlete (or coach) may be looking at inappropriate solutions to performance problems;

- Athletes and parents may see ergogenic aids as opportunities to overcome natural (genetic) limits or as alternatives to training;

- A substance or combinations of substances may be hazardous in short or long run;

- There are enormous unknowns regarding dosage and duration or use; effects of combinations of substances; and their interactions on athletes (such as growth, diabetes, asthma, allergies, etc.);

•Reliance on non-pharmaceutical ergogenic aids may present a gateway to 'harder' substances;
•Positive doping tests following the use of such products are becoming increasingly common;
•There is a potential for personal liability associated with recommending, sanctioning, or not discouraging use of.
• unproved the further erosion of sport ethic.

One of the counter measures

What is currently done by the IOC ?

- education

Since at least 4 years, the IOC warns on a regular basis the athletes not to take any thing without a doctor's advice. This warning has been reinforced since the the huge use of Internet.
Very recently, the IOC Athlete's commission has relayed the IOC in this campaign.

- research

The IOC has launched just after Sydney Games an important research program in collaboration with the IOC accredited laboratory in Cologne (Germany).

Institute of Biochemistry German Sport University Cologne
Manfred-Donike-Society e.V.

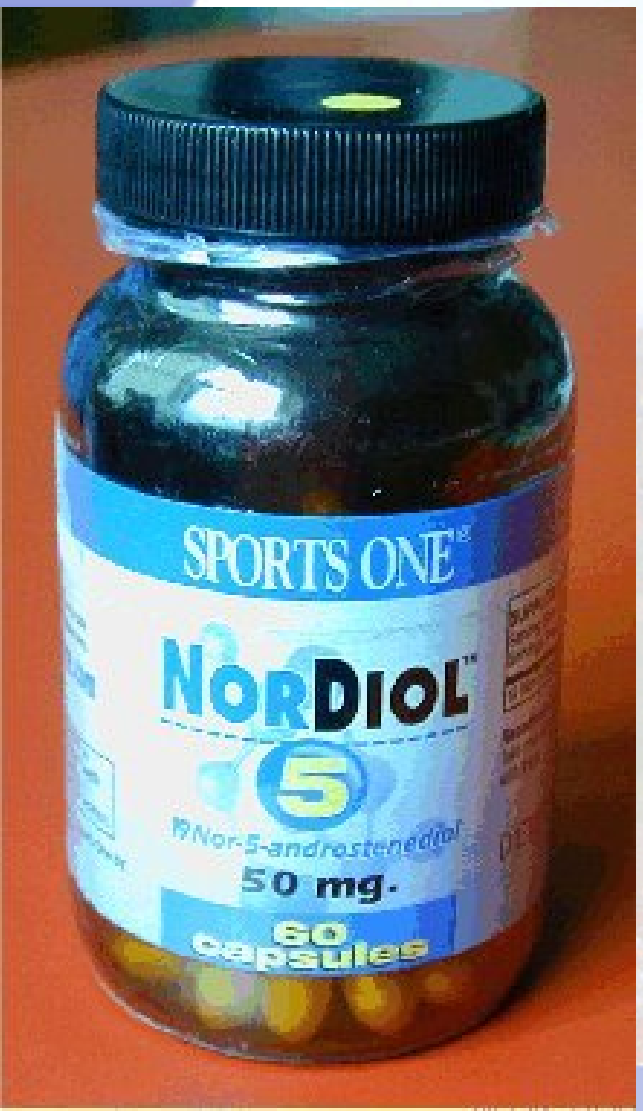
Doping Substances in Nutritional Supplements

Results of the International IOC-Study:

Analysis of Non-Hormonal Nutritional Supplements for Anabolic-Androgenic Steroids

Photo : ©Allsport

Falsely labeled prohormone supplement



Declared content:

19-Nor-5-androstenediol

Actual content:

5-Androstenediol

Photo : ©Allsport

Prohormones

Over the counter anabolic-androgenic steroids

Photo : ©Allsport

Description of the nutritional supplements

- 634 nutritional supplements
- purchased from Oct. 2000 till Nov. 2001
- purchased in 13 countries
- mainly bought in shops (91.2 %) and on the internet (8.2 %)
- from 215 companies located in 15 diff. countries

Photo : ©Allsport

Description of the nutritional supplements

- 289 supplements (45,6%) from prohormone selling companies
- 345 supplements (54,4%) from companies not selling prohormones

Photo : ©Allsport

Analysis of Non-Hormonal Nutritional Supplements for Anabolic-Androgenic Steroids

13 countries of purchase

USA	240	Belgium	30
Germany	129	Spain	29
UK	37	Austria	22
Italy	35	Switzerl.	13
Netherl.	31	Sweden	6
France	30	Hungary	2
Norway	30		

Photo : ©Allsport

Origin of the supplements according to the label

country	no. of companies	no. of samples
USA	105	408
Germany	31	59
UK	5	37
Netherl.	12	27
Italy	15	22
France	13	19
Switzerl.	6	14
Norway	7	12
Belgium	8	10
Spain	5	7
Denmark	4	6
Sweden	1	6
Austria	1	5
Finland	1	1
Portugal	1	1
total	**215**	**634**

Photo : ©Allsport

Occurence of contaminations

- tablets
- capsules
- powders
- drinking ampouls
- oily solutions

Photo : ©Allsport

Formulation of the analysed supplements

- capsules 316
- tablets 231
- powders 72
- fluids 15

Photo : ©Allsport

Positive samples per formulation

formulation	total number of analysed supplements	number of positive samples	number of positive samples relative to the total number
capsules	316	62	19.6 %
tablets	231	27	11.7 %
powder	72	5	6.9 %
fluids	15	-	-

Photo : ©Allsport

Cross-Contamination

- ~~low concentrations~~

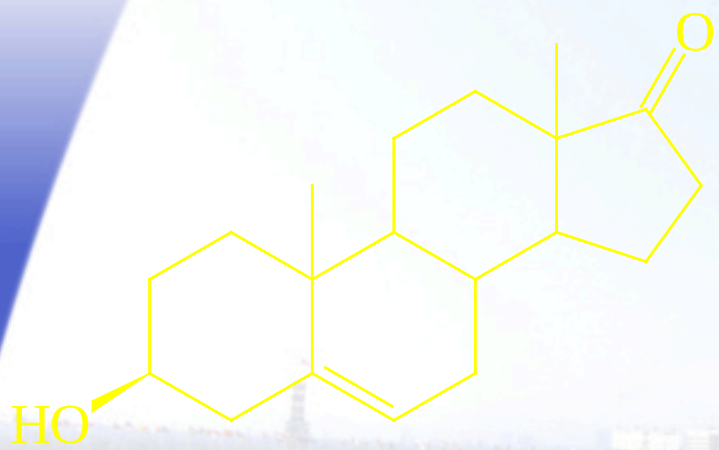
- variation of concentrations from capsule to capsule

all values in µg/capsule

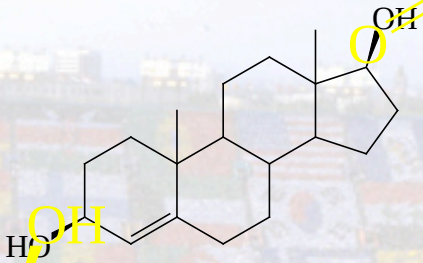
TRIBULUS TERRESTRIS	Charge 1			Charge 2			Charge 3		
	Kap1	**Kap2**	**Kap3**	**Kap1**	**Kap2**	**Kap3**	**Kap1**	**Kap2**	**Kap3**
4-androstendione	0,3	1,3	76,3	0,6	2,6	0,9	1,3	1,4	0,8
5-androstendiol	-	-	-	-	-	-	16,6	30,1	5,6
4-androstendiol	-	0,7	1,5	0,3	1,4	0,8	1,8	3,8	0,8
4-norandrostendione	0,04	0,13	0,64	0,08	0,12	0,17	0,48	0,51	0,22
4-norandrostendiol	-	0,74	1,36	-	1,02	0,51	3,7	15,1	1,6
total amount of steroids	0,3	2,9	79,8	1,0	5,1	2,4	23,9	50,9	9,0
amount of 19-norsteroids	0,04	0,9	2,0	0,08	1,1	0,7	4,2	15,6	1,8

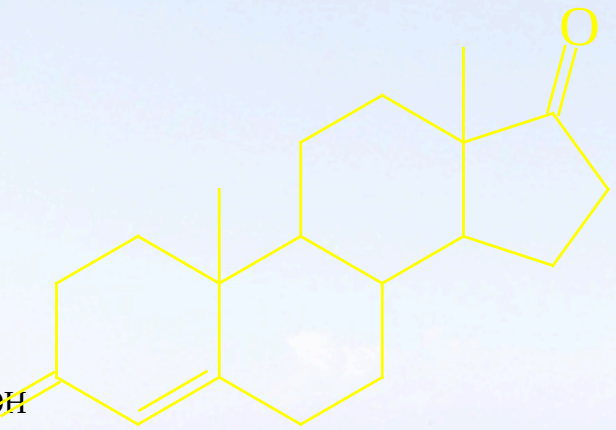
Photo : ©Allsport

Prohormones of Testosterone

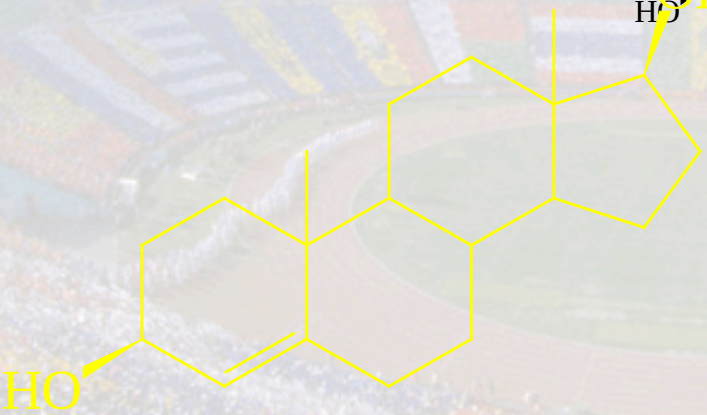


DHEA

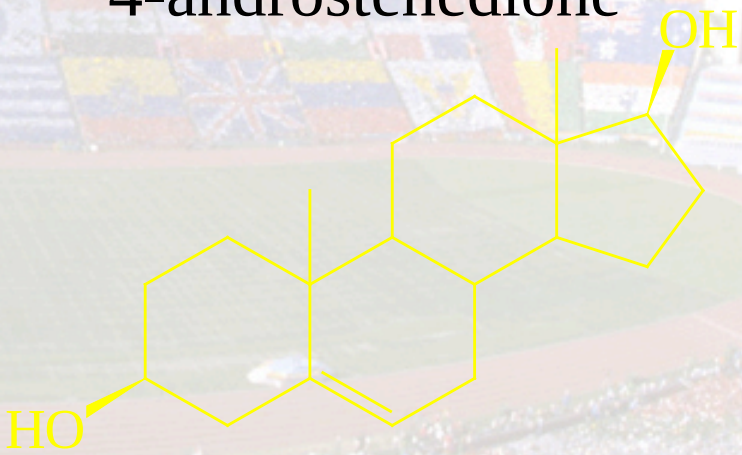




4-androstenedione



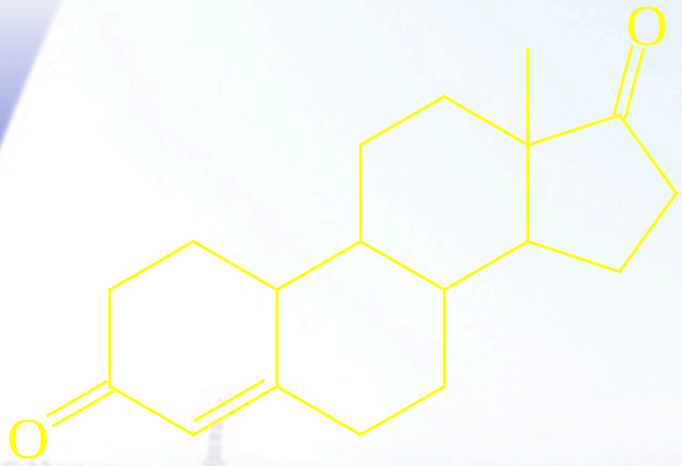
4-androstenediol



5-androstenediol

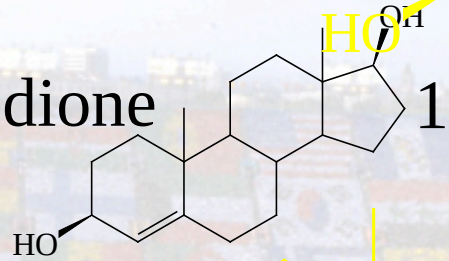
Photo : ©Allsport

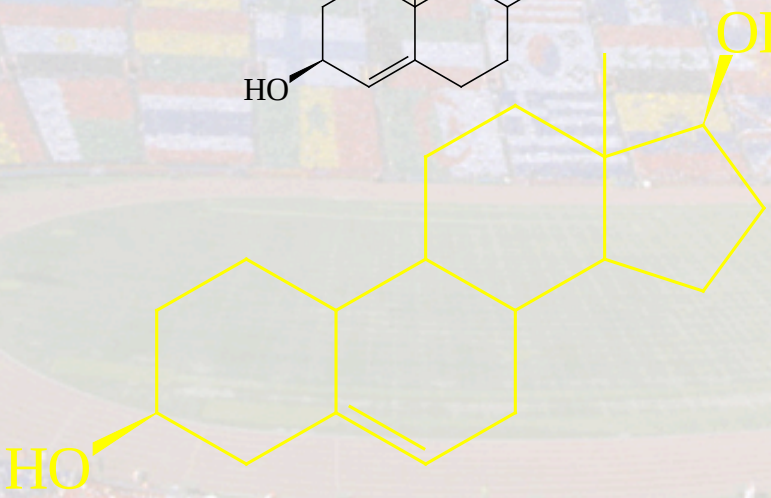
Prohormones of Nandrolone (19-Nortestosterone)



19-Nor-4-androstenedione

19-Nor-4-androstenediol

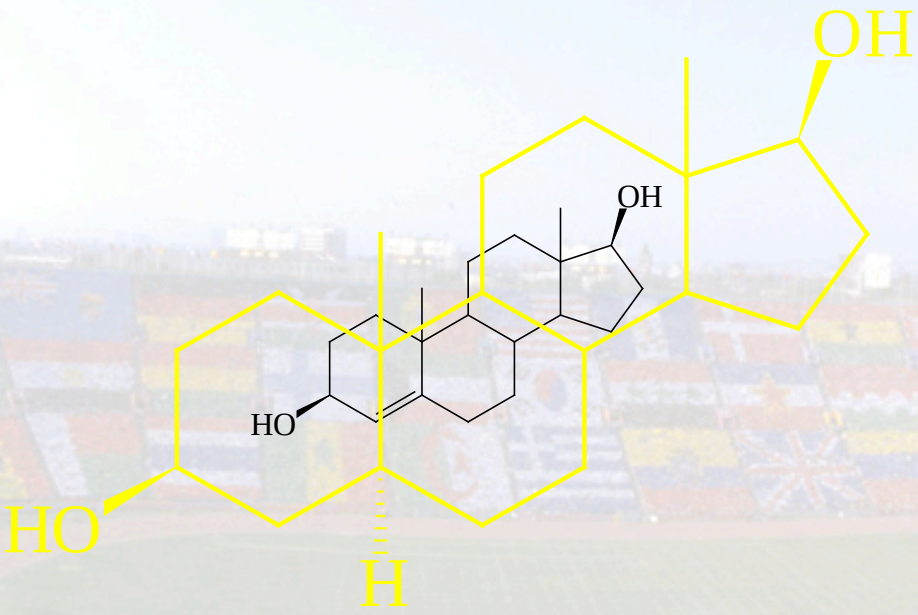




19-Nor-5-androstenediol

Photo : ©Allsport

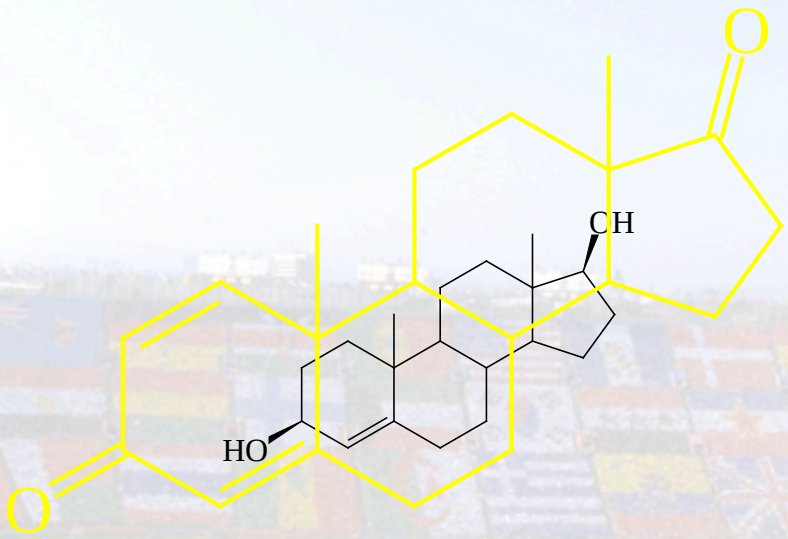
Prohormone of Dihydrotestosterone



5α-Androstanediol

Photo : ©Allsport

Prohormone of Boldenone



Androstadiendione

Photo : ©Allsport

Results of the analysis of 634 nutr. suppl.

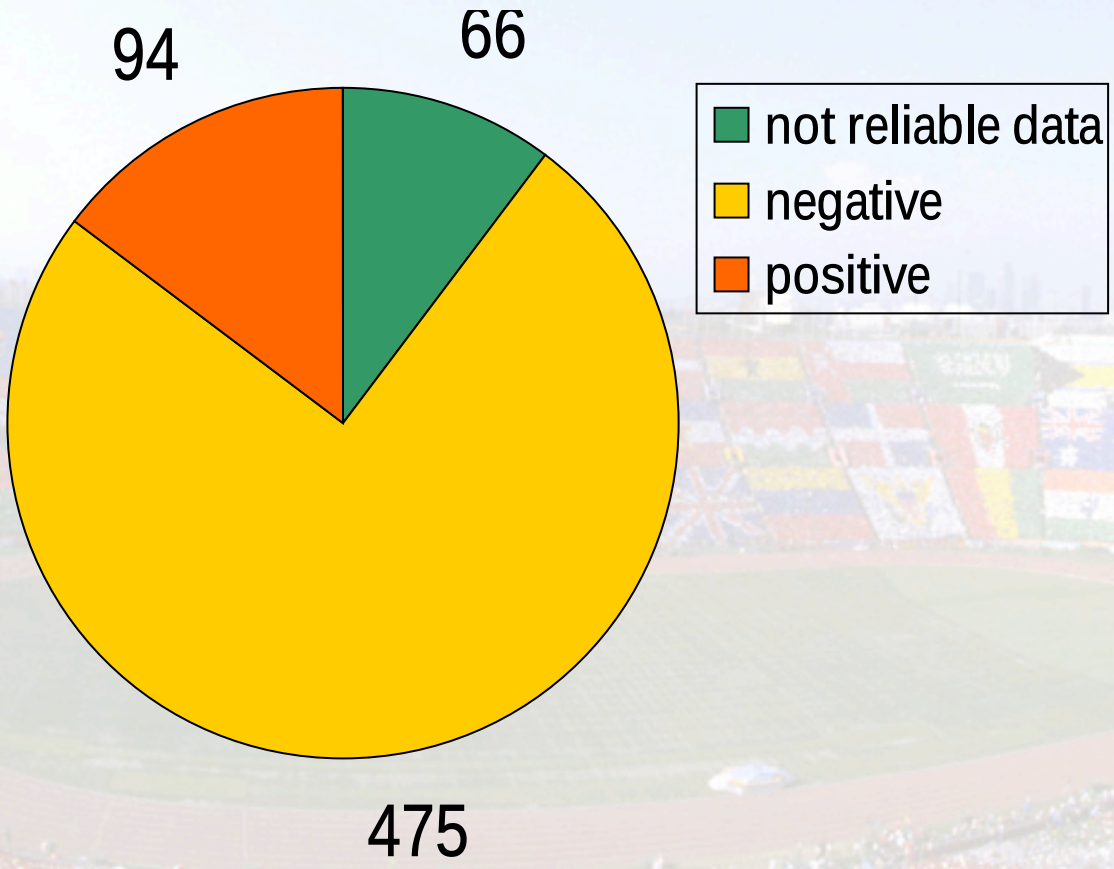


Photo : ©Allsport

Anabolic androgenic steroids in the positive supplements (n=94)

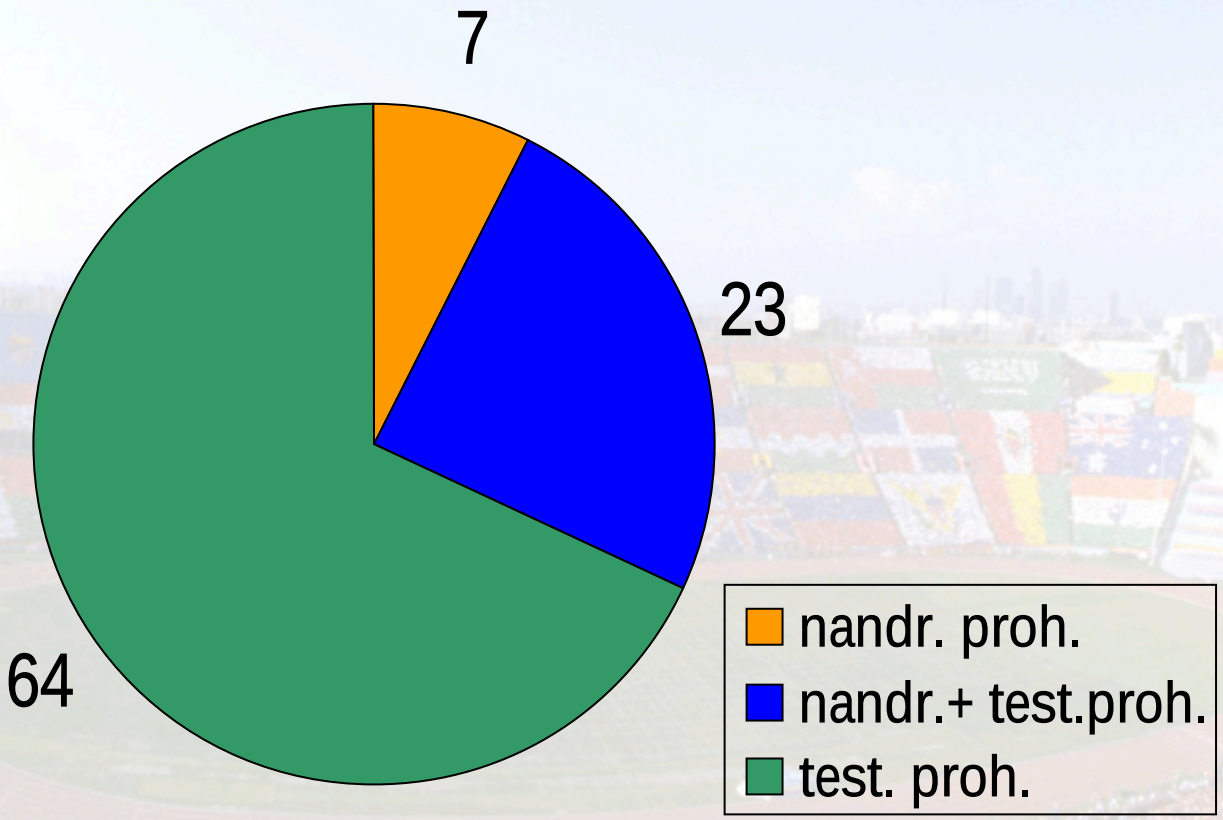


Photo : ©Allsport

Number of positive supplements containing specific prohormones

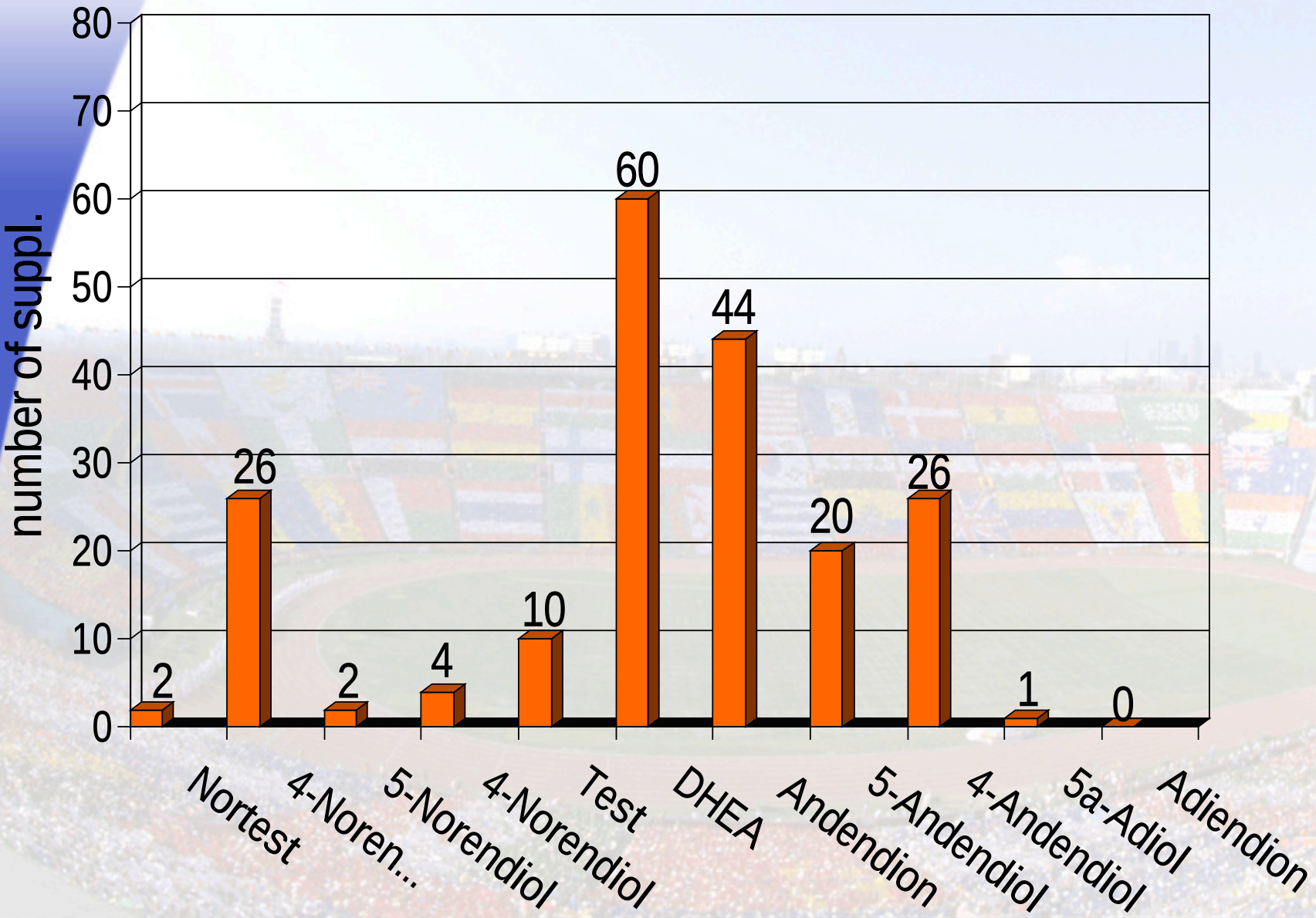


Photo : ©Allsport

Number of detected steroids per positive sample

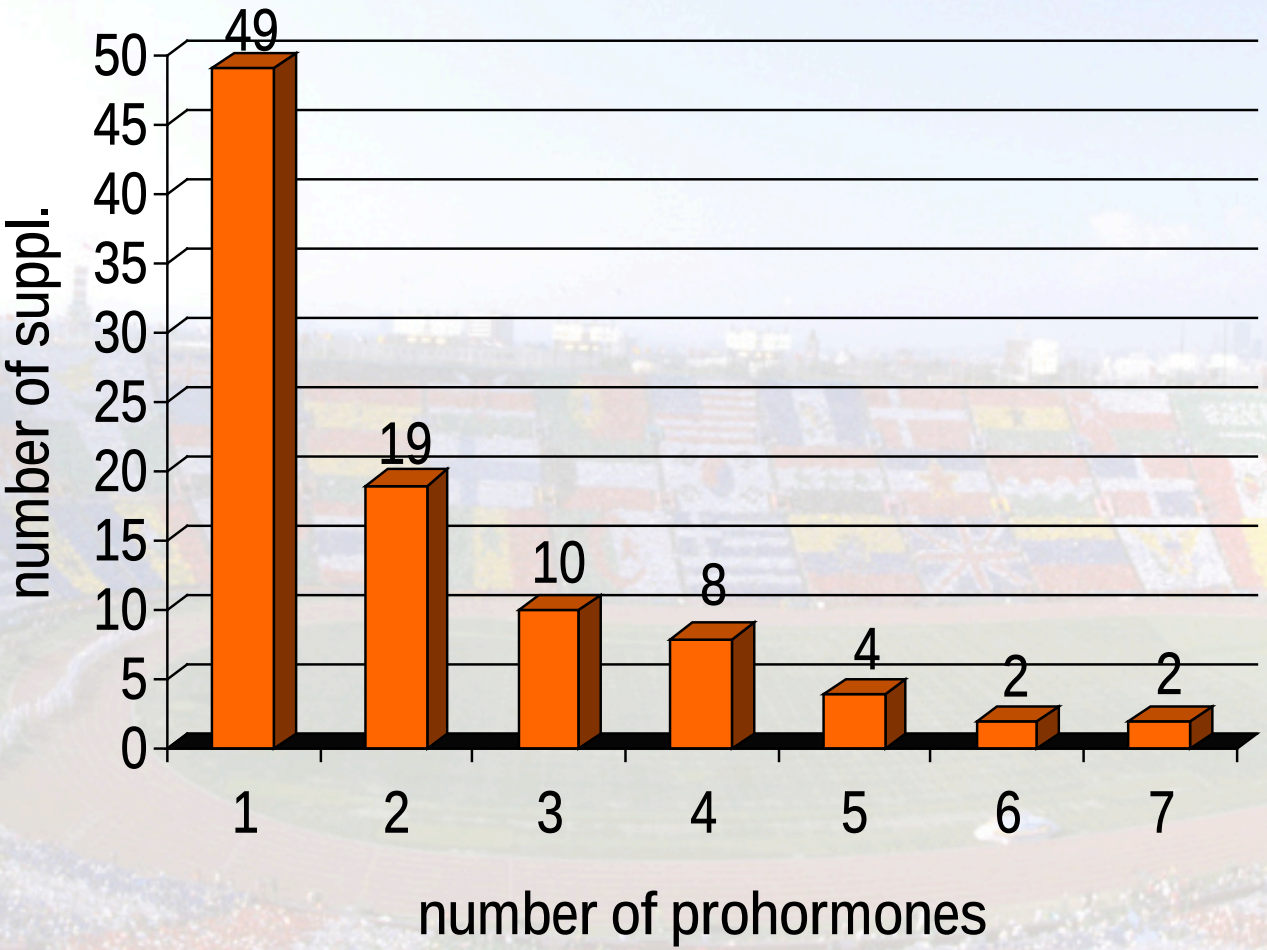
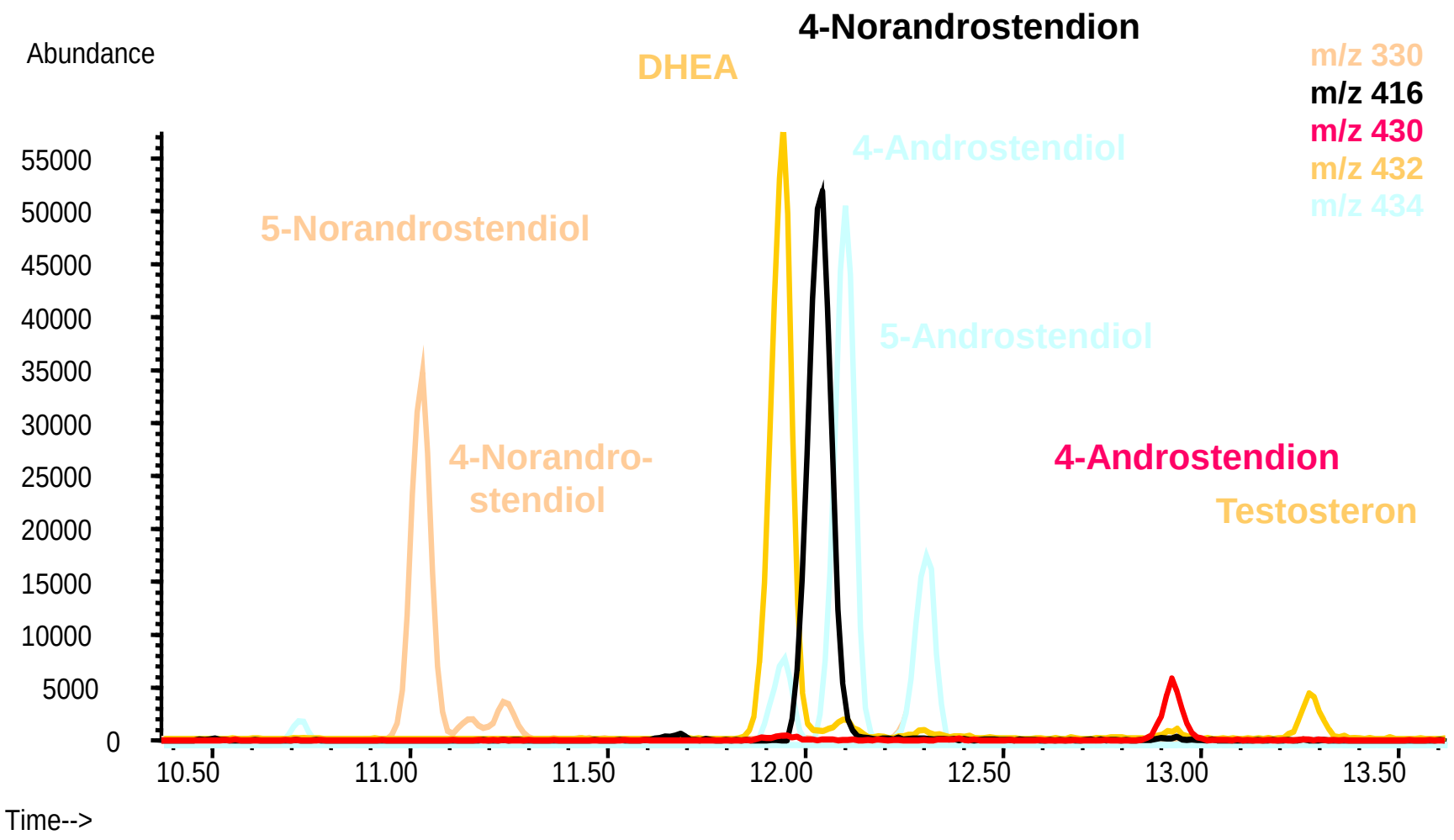


Photo : ©Allsport

Not declared prohormones in a creatine product



Main ingredients declared on the labels of positive samples

- amino acids/ proteins
- vitamines + minerals
- carnitine
- creatine
- ribose
- BCAA
- HMB
- pyruvate
- chrysin
- enzymes
- CLA and other oils
- herbal extracts
- melatonin

Photo : ©Allsport

Distribution of the total prohormone concentrations (µg/g) in the positive samples (n=94)

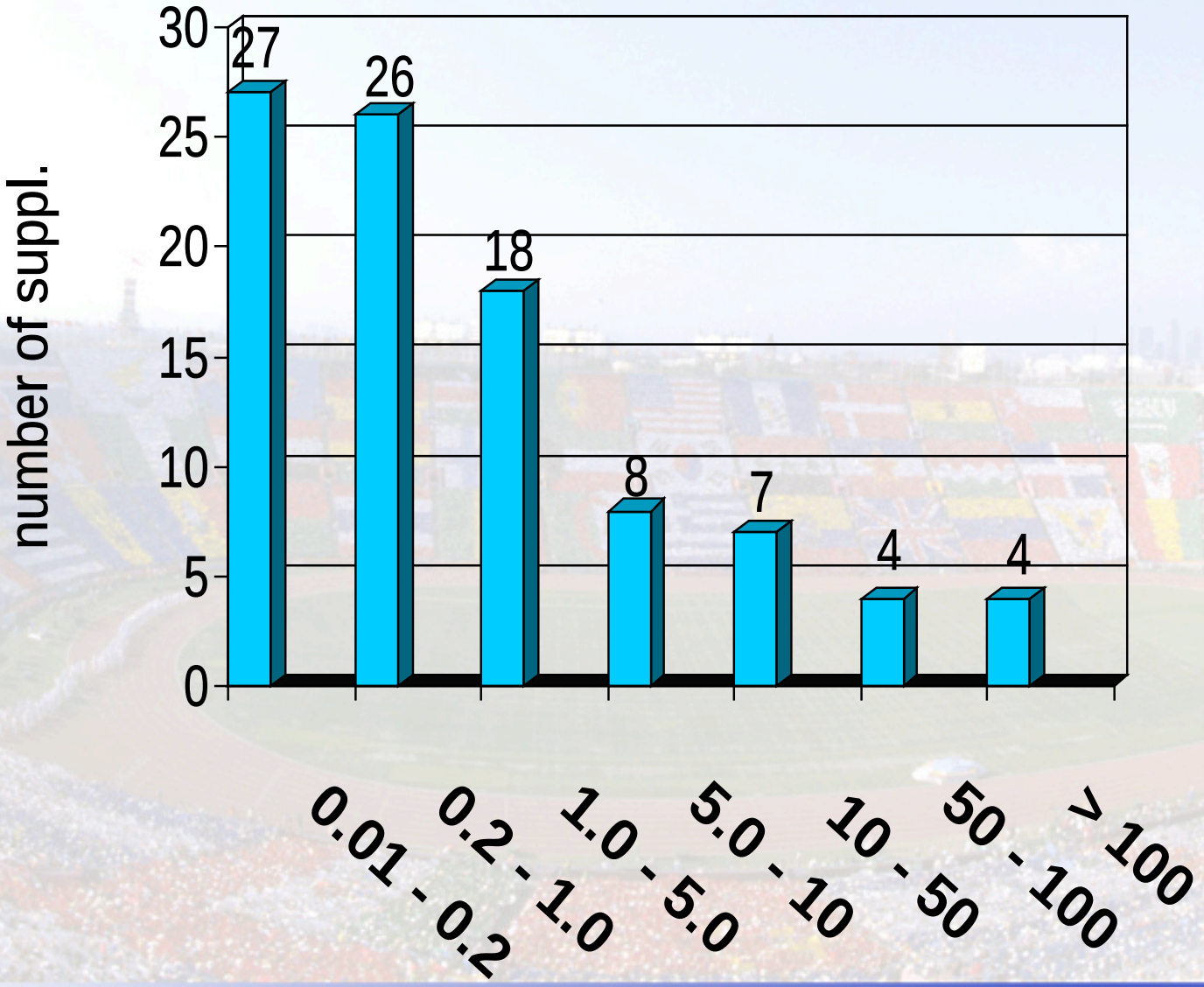


Photo : ©Allsport

Distribution of the nandrolone prohormone concentrations (µg/g) in the positive samples (n=94)

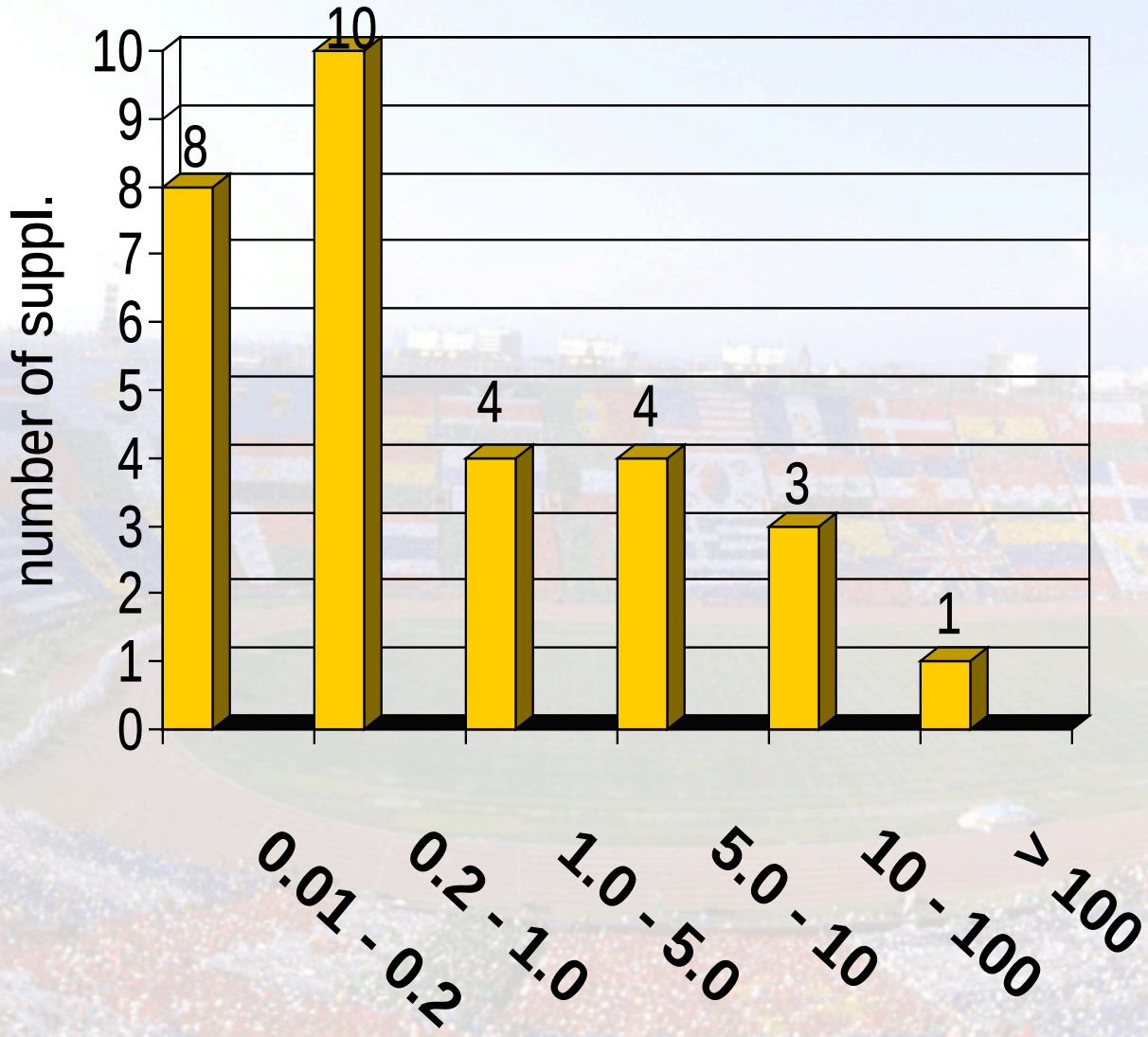


Photo : ©Allsport

Positive nutr. suppl. in relation to the total number of supplements purchased in different countries

country	no. of products	no. of positives	percentage of positives
Netherlands	31	8	25.8 %
Austria	22	5	22.7 %
UK	37	7	18.9 %
USA	240	45	18.8 %
Italy	35	5	14.3 %
Spain	29	4	13.8 %
Germany	129	15	11.6 %
Belgium	30	2	6.7 %
France	30	2	6.7 %
Norway	30	1	3.3 %
Switzerland	13	-	-
Sweden	6	-	-
Hungary	2	-	-

Photo : ©Allsport

Origin of the positive samples according to the label

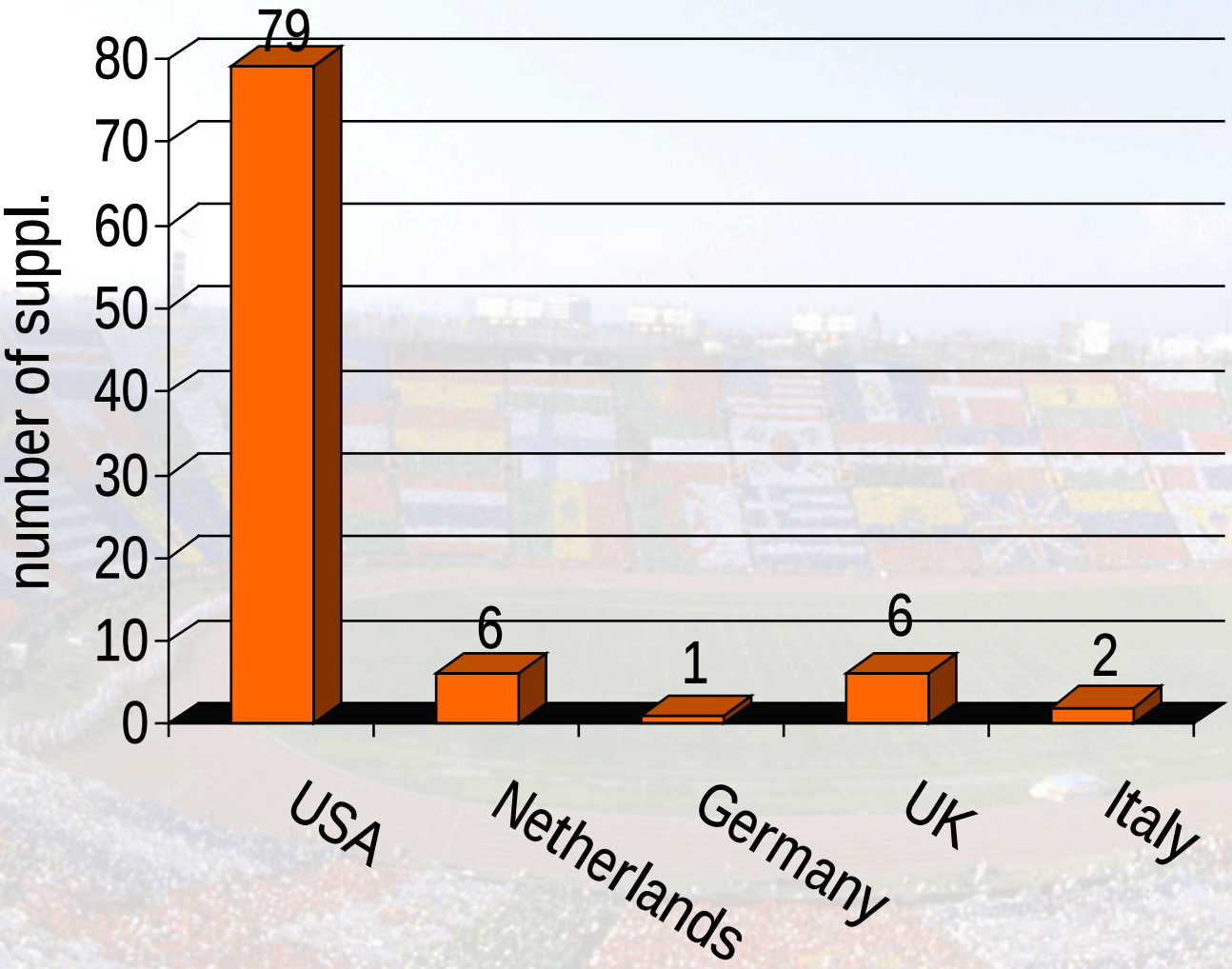


Photo : ©Allsport

Origin of the positive suppl. in relation to the total number of supplements from the respective country

country	no. of samples	no. of positive samples	percentage of positives
Netherlands	27	6	22.2%
USA	408	79	19.4%
UK	37	6	16.2%
Italy	22	2	9.1%
Germany	59	1	1.7%
Austria	5	-	-
Belgium	10	-	-
Switzerland	14	-	-
Danmark	6	-	-
Spain	7	-	-
France	19	-	-
Finland	1	-	-
Norway	12	-	-
Portugal	1	-	-
Sweden	6	-	-

Photo : ©Allsport

Location of nutr. suppl. companies and the proportion of companies with positives

country	no. of companies	no. of companies with positives	percentage of companies with positives
UK	4	2	50.0%
Netherlands	12	5	41.7%
USA	106	43	40.6%
Italy	15	2	13.3%
Germany	31	1	3.2%
Austria	1		
Belgium	8		
Switzerland	6		
Denmark	4		
Spain	5		
France	13		
Finland	1		
Norway	7		
Portugal	1		
Sweden	1		

Photo : ©Allsport

Origin of the positive samples according to the label

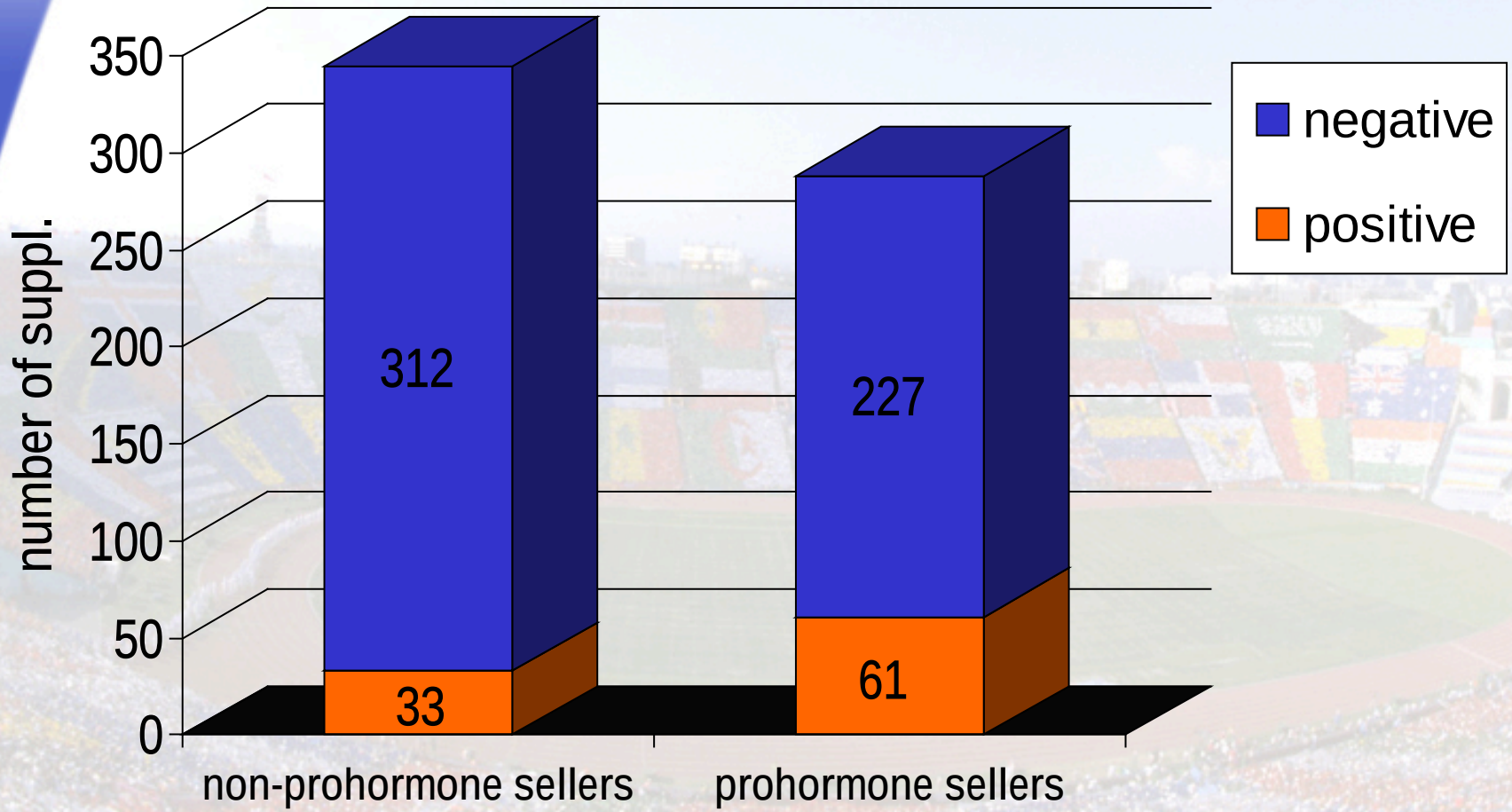


Photo : ©Allsport

Urinary TEST/EPIT ratios after application of nutritional supplements containing different amounts of testosterone prohormones

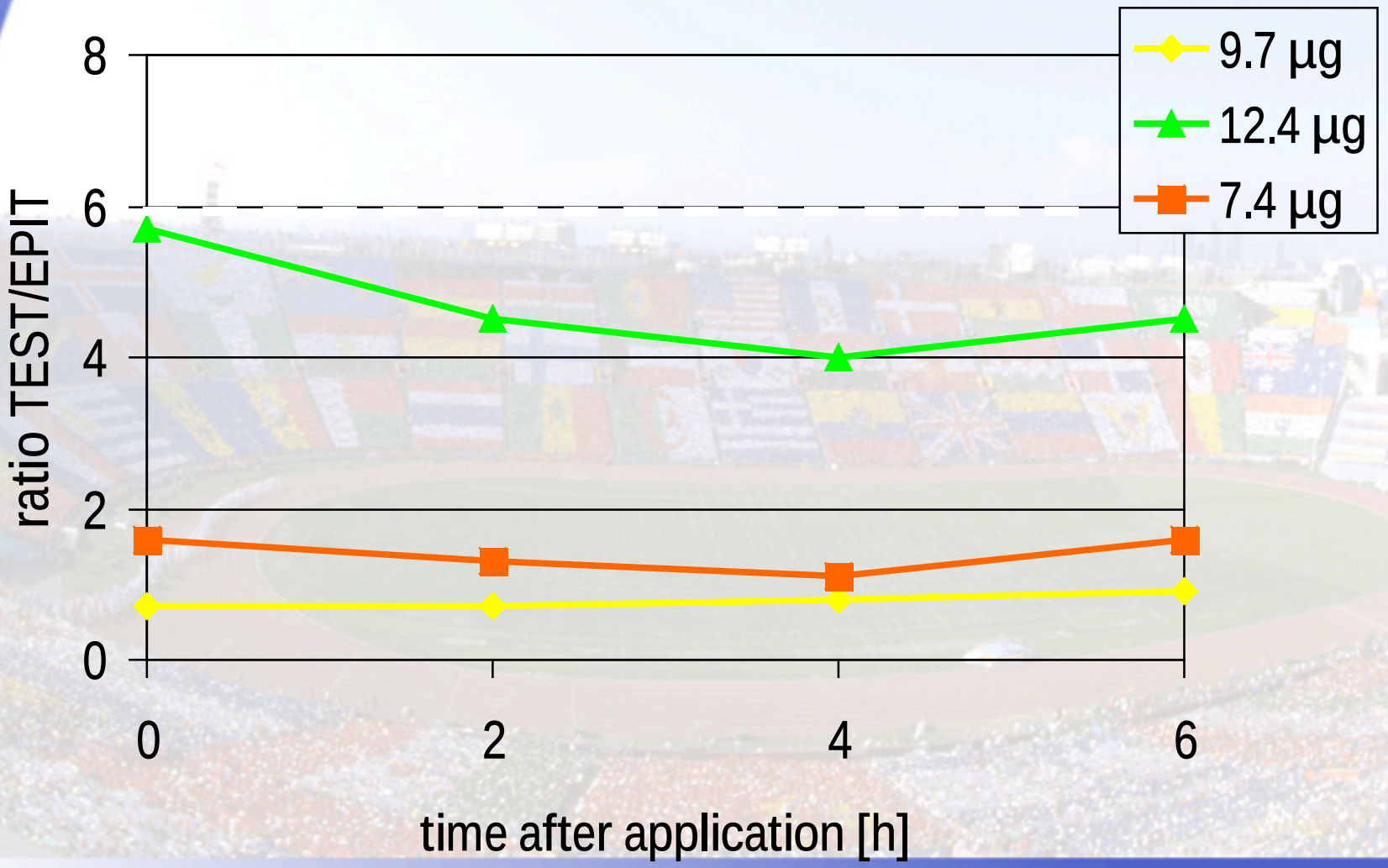


Photo : ©Allsport

Metabolism of the prohormones of 19-nortestosterone

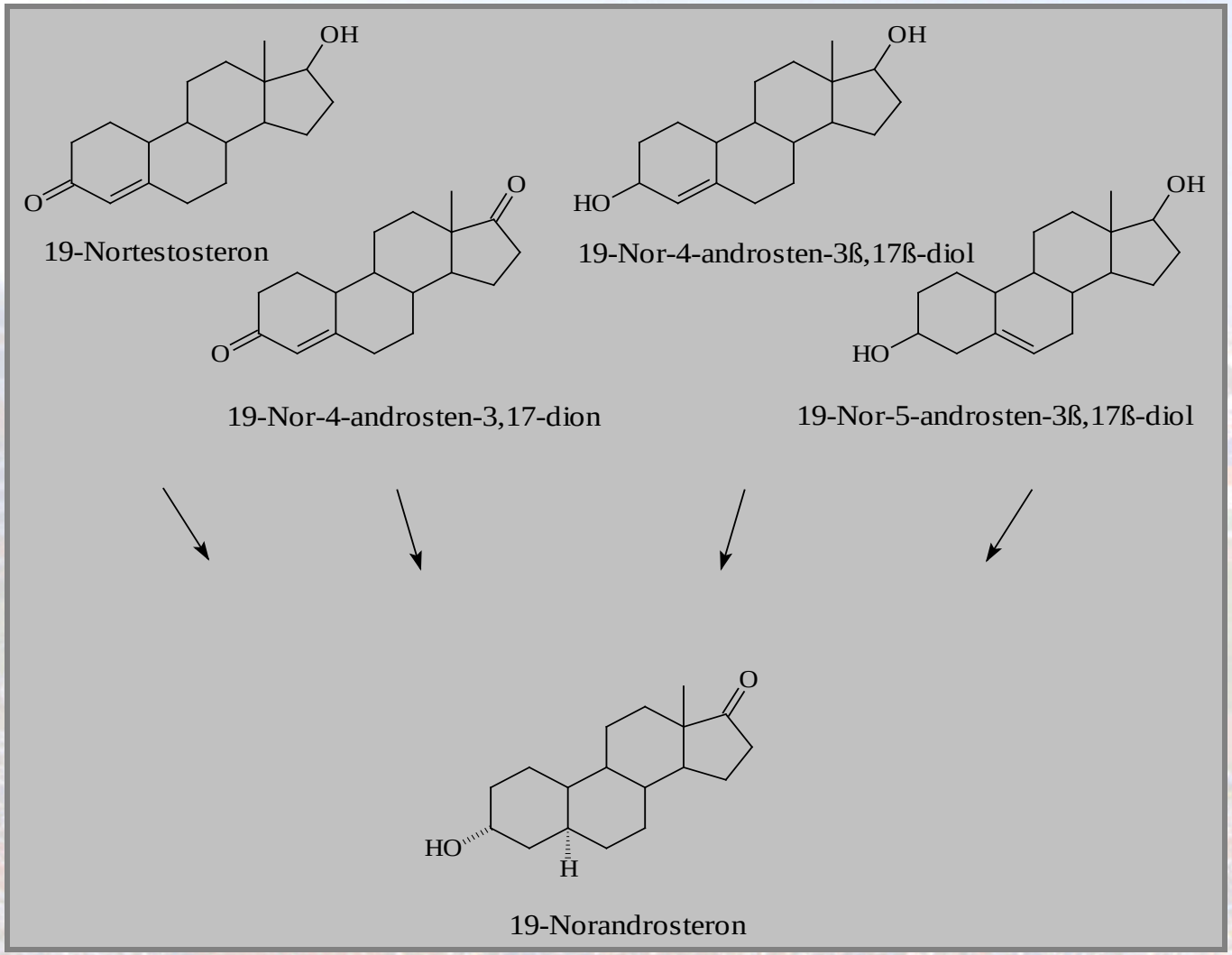
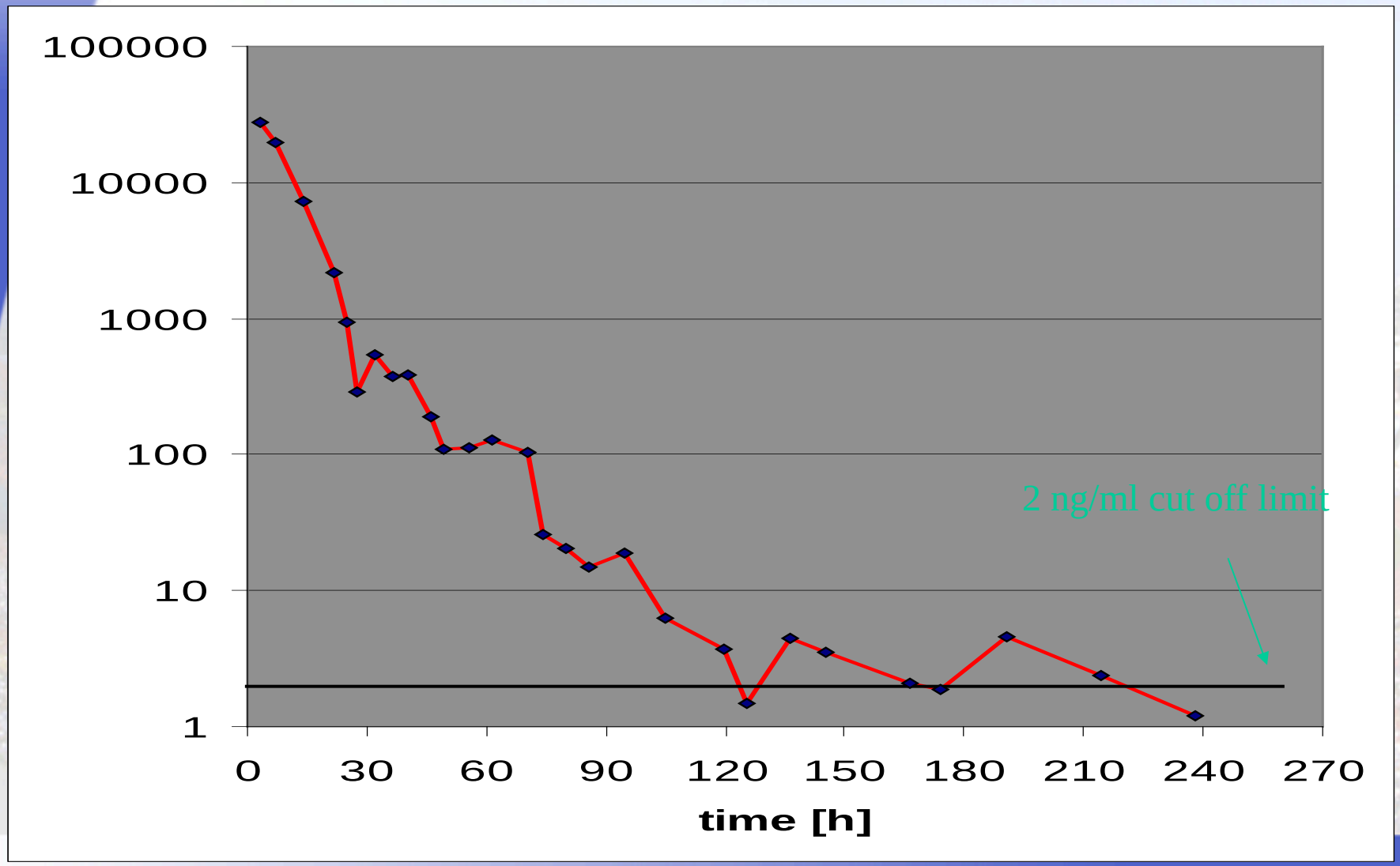


Photo : ©Allsport

Concentration of norandrosterone [ng/ml] after oral application of 100 mg Norandrostenedione



Urinary norandrosterone concentrations after application of nutritional supplements containing different amounts of 4-norandrostendione

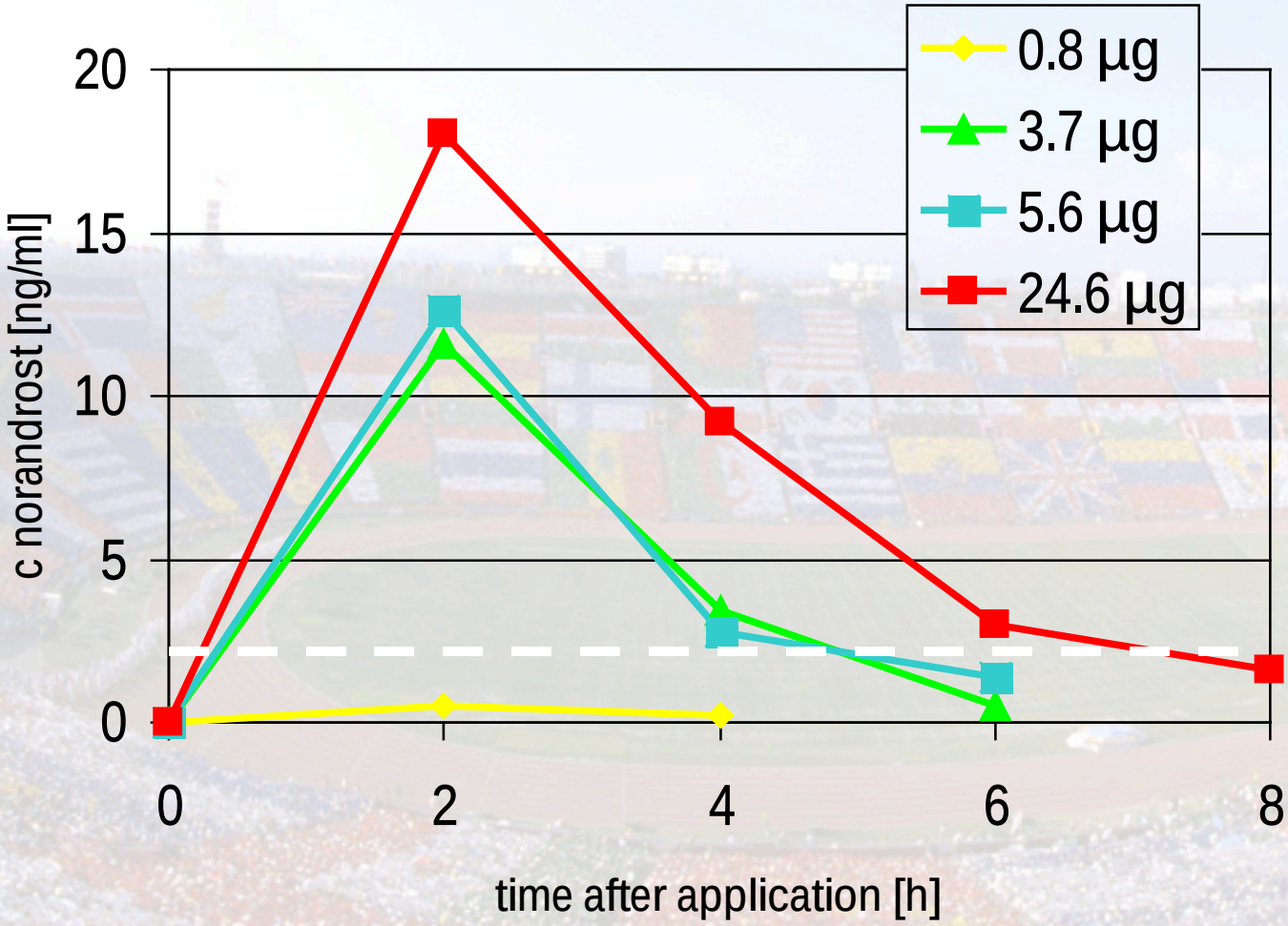


Photo : ©Allsport

Contaminated creatine chewing tablets in Germany

- **Declared content:** Creatine + Dextrose

- **Not declared prohormones:**
  4-Norandrostendione 4,4 µg/tablet
  4-Norandrostendiol 10,9 µg/tablet

- **2 hours after application of 2 tablets:**
  urinary norandrosterone: 19,8 ng/ml

Photo : ©Allsport

"Sportscreme" for transdermal application of prohormones

Checkout

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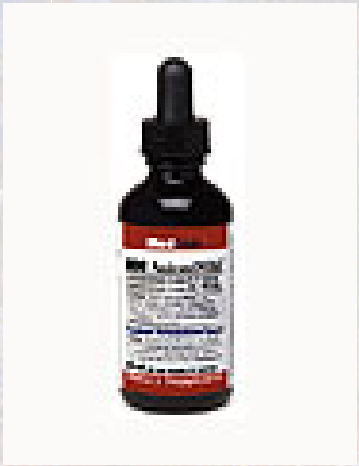
NorAndrosteDERM



NorAndrosteDERM
Price:
$74.95
Shipping Weight:
1.00
pound(s)

Photo : ©Allsport

Spray " for transdermal application of prohormones

Nandrosol

Nandrosol, the spray on prohormone from Biotest, is in stock. Formulated into a crystal-clear, topical skin spray, Biotest Nandrosol provides ultra-pure (purified through a proprietary filtration system) 19-norandrostenediol. Each 240-ml (8-ounce) bottle of Nandrosol contains 12 grams of 19-norandrostenediol (50 mg/ml). One bottle can last between 12 days (heavy use) and 30 days (moderate use).

BIOTEST IS NO LONGER PRODUCING NANDROSOL. FOR A GREAT NORANDRODIOL PRODCUT, TRY CYCLONORDIOL FROM KAIZEN. IT SHOULD WORK AS GOOD OR BETTER THAN NANDROSOL.

BIO **$59.95**

Photo : ©Allsport

Spearmint for buccal/sublingual application of prohormones

Kaizen,

Cyclo-NorDiol, Spearmint

Photo : ©Allsport

Acknowledgement

The investigations were granted by the IOC

Photo : ©Allsport

Conclusions

- The problem of non-hormonal nutritional supplements containing prohibited anabolic-androgenic steroids is an international problem.
- The consumption of such nutritional supplements may lead to positive doping results.
- To minimize the risk, athletes should only buy nutritional supplements from companies, which perform a quality check for prohormones and/or which can guarantee that they have no contact with prohormones in the production and transportation processes.

Photo : ©Allsport

Conclusions

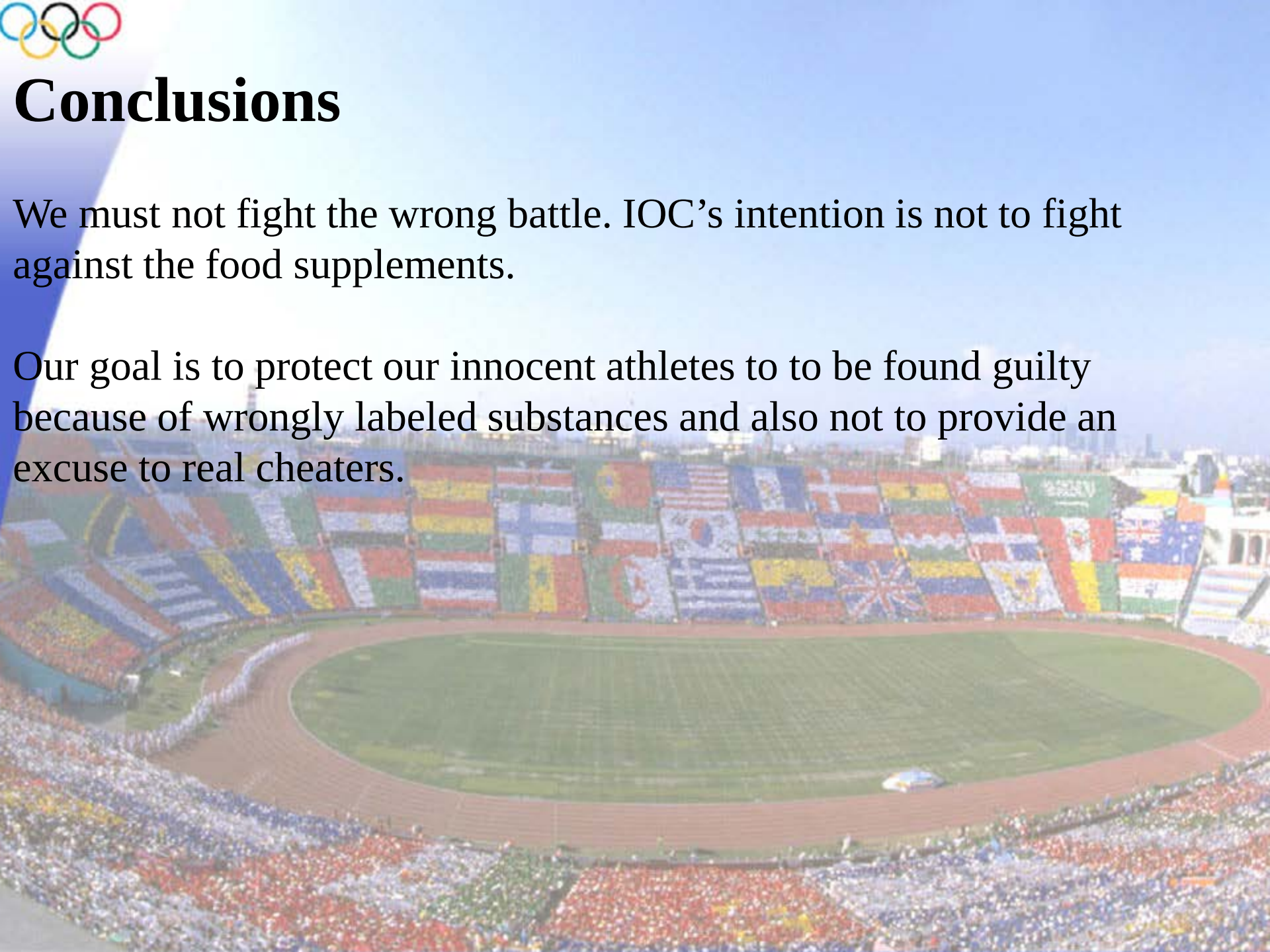
- Classification of prohormones as medicaments (GMP)
- General discussion about the sense of the use of nutritional supplements in sports.

Photo : ©Allsport

Conclusions

We must not fight the wrong battle. IOC’s intention is not to fight against the food supplements.

Our goal is to protect our innocent athletes to to be found guilty because of wrongly labeled substances and also not to provide an excuse to real cheaters.




Thank you