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Contribution to Fundamental Elements - Forbidden Substances

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European Sports Conference  
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**Contribution to Fundamental Elements - Forbidden Substances.**

The definition of doping of the IOC Medical Commission is based on the banning of classes of substances and banning of methods (compare annex I).

To test for the different classes of dope agents analytical methods were elaborated taking into account the chemical and biochemical properties of the compounds (annex II).

The summary of the analyses performed by the IOC accredited laboratories for 1986 and 1987 is attached as annex III. In annex IV the positive results of the A-analyses are summarized. This statistics of the substances detected demonstrates that even for competition controls the main problem was the misuse of anabolic steroids. It is recognized by all parties engaged in sports that the misuse of anabolic steroids takes place in the training period.

Regarding the scope of the analysis for out-of-competition samples the subcommission doping and biochemistry of sport of the IOC Medical Commission has discussed the problem which may arise out of the wishes to test not only for anabolic steroids but also for other classes of substances. In the case of stimulants, belonging to the group of psychotropic drugs and of substances belonging to the group of narcotics, both controlled substances by international agreement, legal problems may arise. The question will be if sport authorities will report or have to report to legal authorities positive findings in their area.

The beta-blockers are relevant only for a few sports, there may be a request of national and international federations asking for testing for beta-blockers to avoid also their misuse in the training period. This should be a question which the national respectively the international federation should decide.

In case that in out-of-competition controls diuretics or masking agents like probenecid have been used two alternatives exist:

1. Let the athlete wait under supervision until a second urine sample can be produced; send the first and the second urine sample to the laboratory for analysis.
2. Even if a first urine sample seems to be inadequate, taking colour and specific density into account, ask for a second urine sample, if the laboratory report demonstrates that the concentration of the endogenous steroids are so diluted that correct analytical results cannot be expected. In this case a second urine sample should be asked for without prewarning.

**Summary**

Out-of-competition controls should be performed to detect the misuse of anabolic steroids. In case that a dilute urine contains diuretics and/or masking agents a second urine sample should be asked for without prewarning.

No analysis should be performed for stimulants, narcotics and beta-blockers.

## ANNEX I

## Doping Definition of the Medical Commission of IOC for the Olympic Winter and Summer Games 1988 (Calgary and Seoul)

List of Doping Classes and Methods

## I. DOPING CLASSES

- A. Stimulants
- B. Narcotics
- C. Anabolic Steroids
- D. Beta-Blockers
- E. Diuretics

## II. DOPING METHODS

- A. Blood Doping
- B. Pharmacological, Chemical and Physical Manipulations

## III. CLASSES OF DRUGS SUBJECT TO CERTAIN RESTRICTIONS

- A. Alcohol
- B. Local anaesthetics
- C. Corticosteroids

NOTE: The doping definition of the IOC Medical Commission is based on the banning of pharmacological classes of agents.

This definition has the advantage that also new drugs, some of which may be especially designed for doping purposes, are banned.

The following list represents examples of the different dope classes to illustrate the doping definition. Unless indicated all substances belonging to the banned classes may not be used for medical treatment, even if they are not listed as examples. If substances of the banned classes are detected in the laboratory, the IOC Medical Commission will act. It should be noted that the presence of the drug in the urine constitutes an offence, irrespective of the route of administration.

Tab. 3:

**Beispiele zu den verbotenen Wirkstoffgruppen**

**A. Stimulantien, zum Beispiel:**

Amfepramon	Koffein* (Coffein)
Amfetaminil	Kokain (Cocain)
Amiphenazol	Mefenorex
Amphetamin	Methamphetamin
Benzphetamin	Methoxyphenamin
Cathin	Methylephedrin
Chlorphentermin	Methylphenidat
Clobenzorex	Morazon
Clorprenalin	Nikethamid
Cropropamid**	Pemolin
Crotethamid**	Pentetrazol
Dimetamfetamin	Phendimetrazin
Ephedrin	Phentermin
Etafedrin	Phenylpropanolamin
Etamivan	Pipradol
Etilamfetamin	Prolintan
Fencamfamin	Propylhexedrin
Fenetyllin	Pyrovaleron
Fenproporex	Strychnin
Furfenorex	
und verwandte Verbindungen.	

\* Ein positiver Dopingfall mit Koffein liegt vor, wenn die Koffeinkonzentration im Urin 12 Mikrogramm/ml übersteigt.

\*\* Bestandteile von Micoren<sup>R</sup>.

**B. Narkotika, zum Beispiel:**

Alphaprodin	Levorphanol
Anileridin	Methadon
Buprenorphin	Morphin
Codein	Nalbuphin
Dextromoramid	Pentazocin
Dextropropoxyphen	Pethidin
Diamorphin (Heroin)	Pheazocin
Dihydrocodein	Trimeperidin
Dipipanon	und verwandte Verbindungen
Ethoheptazin	
Ethylmorphin	

**C. Anabole Steroide, zum Beispiel:**

Bolasteron	Nandrolon
Boldenon	Norethandrolon
Clostebol	Norethisteron
Dehydrochlormethyltestosteron	Oxandrolon
Fluoxymesteron	Oxymesteron
Mesterolon	Oxymetholon
Metandienon	Stanozolol
Metenolon	Testosteron*
Methyltestosterone	
und verwandte Verbindungen	

\* Als Doping gilt die Applikation von Testosteron und jede andere Manipulation, die dazu führt, daß das Verhältnis der Urinkonzentration von Testosteron zu Epitestosteron höher als 6 liegt. Es ist bekannt, daß die Applikation von Choriogonadotropin (HCG-Schwangerschaftshormon) und anderen Verbindungen mit ähnlicher Wirkung bei Männern zu einer erhöhten Produktion von androgenen Steroiden führt. Die Anwendung dieser Wirkstoffe ist daher verboten.

**D. Beta-Blocker, zum Beispiel:**

Acebutolol	Nadolol
Alprenolol	Oxprenolol
Atenolol	Propranolol
Labetalol	Sotalol
Metoprolol	
und verwandte Verbindungen	

**E. Diuretika, zum Beispiel:**

Acetazolamid	Diclofenamid
Amilorid	Etacrynsäure
Bendrollumethiazid	Furosemid
Bumetanid	Hydrochlorothiazid
Canrenon	Mersalyl
Chlormerodrin	Spiroolacton
Chlortalidon	Triamteren
und verwandte Verbindungen	

Chemical/Biochemical  
Classification

Sample Preparation

Analytical Methods

Chemical/Biochemical Classification	Sample Preparation			Analytical Methods		
	Hydro- lysis	Extrac- tion	Derivati- sation	Separa- tion technique	Detect- tion technique	Sensitivity (ng/ml)
1. Nitrogen containing compounds excreted free in the urine e.g. amphetamine, ephedrine	no	ether pH>12	no	GLC	N-FID	100
2. Nitrogen containing compounds excreted as conjugates with sulfate or glucuronic acid phenolalkylamines, $\beta$ -blockers, morphine	yes	ether- alcohol	TMS/TFA TFA	GLC	N-FID/MS	10
3. Stimulants with special chemical structure and properties pemoline, caffeine	no	ethyl- acetate	no	HPLC	UV/VIS MS	100
4. Anabolic steroids. excreted free metandienone, oxandrolone	no	XAD2 ether	TMS TMS/HFB	GLC GLC	MS MS	1 1
5. Anabolic steroids excreted as conjugates nandrolone, metenolone, testosterone	yes	XAD2 ether	TMS	GLC	MS	1
6. Acidic compounds like most of the diuretics. furosemide, etacrynic acid	no	ether pH<2	CH <sub>3</sub> J	GLC/HPLC	UV/VIS MS	10

ANNEX II

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ANNEX III

IOC-ACCREDITED LABORATORIES STATISTICS

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 Summary of Samples Analysed by  
 IOC Accredited Laboratories 1986 and 1987

	Number of samples	Number of analytically positive A-samples	Per- centage %	Year
-----				
Competitions	15533	261	1.68	1986
with National	13381	332	2.48	1987
Competitors only				
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Competitions				
with	5227	79	1.51	1986
International	8159	173	2.12	1987
Competitors				
-----				
Major Inter-	4449	111	2.49	1986
national	9759	229	2.35	1987
Championships				
-----				
Samples collected	6505	137	2.11	1986
out-of-competition	5870	70	1.19	1987
(but see below)				
-----				
Checking of				
competitors	1268	35	2.76	1986
prior to major	713	50	7.01	1987
Championships				
-----				
total	32982	623	1.89	1986
	37882	854	2.25	1987

## ANNEX IV

## IOC-ACCREDITED LABORATORIES STATISTICS

Frequencies of detected substances,  
grouped in classes of dope agents

Classes of dope agents	N	N
	1986	1987
A. Stimulants	177	300
B. Narcotics	23	55
C. Anabolic Steroids	439	521
D. Beta-Blockers	31	32
E. Diuretics	2	9
"Masking Agents" (probenecid)		24
total	672	941

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