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Dietary Supplements

Benefits and Risks to Consumers

RESEARCH FEATURE

Fighting the Fallout of
Supplements in Sports

OUT OF THE BOX

Think Twice Before Buying
Supplements Online

INTERVIEW



Dr. P. L. SAHU
Director and CEO

India's National Dope Testing Laboratory (NDTL)

PLUS

ROUND UP • MY MARKET • THE PRESCRIPTION

VIEWPOINT



MESSAGE FROM PUBLISHER & EDITOR

There's More to Dietary Supplements Than Meets the Eye!



THE TEMPTATION TO pop a pill to look macho or to improve physical performance is quite difficult to resist. Gyms are crowded with bodybuilders who guzzle energy drinks and protein shakes while working out to build the coveted abs, biceps and more! More so with sportspersons who are competing at national and international platforms. Especially when that crucial one second or kg can make a world of difference - opening doors to a lifetime of glory, money, endorsements, government jobs and more.

Alas, the use of performance-enhancing drugs is common across most sports and levels of competition. While many players indulge in different types of drugs to improve their physical capacity and endurance or to increase muscle mass and strength, others dabble in them just to recuperate quickly after excessive training. But is it right or even justified? Don't these supplements give the athletes an unfair advantage that violates the fundamental spirit and integrity of the sport itself? Not to mention the toll it takes on their health in the long run...

Termed as doping, such intake of drugs is widely prohibited across the world and athletes have to regularly undergo drug testing to ensure that they are not taking any of the substances that figure on the prohibited lists.

However, doping is not always wilful; some sportspersons end up inadvertently ingesting these prohibited substances – either in the form of regular supplements or standard medications for certain health conditions. They may be unaware of the prohibited ingredients, but still have to suffer the ignominy when their blood or urine samples test positive with even mild traces of dope.

Come to think of it, it's not just sportspersons alone. Regular people imbibe energy drinks, pre-workout supplements and even vitamin tablets without having any clue of the dangerous side effects they can unleash in the body.

With entire careers and lives at stake, this issue of The Aware Consumer attempts to educate consumers about what makes performance drugs and supplements unsafe and how to avoid them.

Prof. Bejon Kumar Misra
Publisher & Editor
bejonmisra@theawareconsumer.in

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PRAFULL D. SHETH

Editorial Board Member

INTERVENTIONS TO COUNTER DOPING IN SPORTS



ALMOST EVERY INTERNATIONAL sporting competition of repute is rocked by a couple of doping scandals – both intentional and unintentional. At times, high-profile names make it to the list with some even being stripped of their medals when their drug intake comes to light.

As we all know, use of drugs to enhance performance is strictly prohibited across sports as it is considered tantamount to cheating. The offenders have to pay a heavy price in the form of bans for a couple of years and repeaters being banned for life.

Drug screening is the yardstick for both punishing those who cross the line (pun unintended) and deterring those who find it tempting to use pills to up their game!

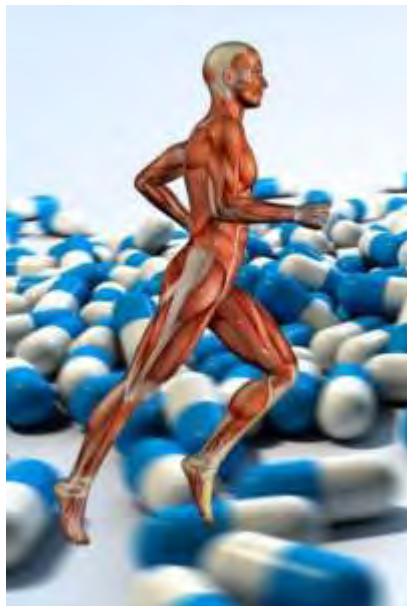
While WADA (World Anti-Doping Agency) is responsible for defining and implementing anti-doping policies in all sports at the international level, India has its own National Anti-Doping Agency (NADA). The testing end is entrusted to National Dope Testing Laboratory (NDTL), which is WADA-accredited for its state of the art facilities that provide precise and dependable services. Together, they are leading the

fight against drug abuse in Indian sports. Even the FSSAI has been roped in to ensure availability of safe and dope-free dietary/nutritional products for sportspersons. Keeping sports clean and free of drugs is a huge mandate and though the authorities are rising to the occasion, they are only able to scratch the surface at best. It is very easy to bypass the laws as barely a handful of the miscreants ever get caught. Despite the rigorous anti-doping machinery, the constant advent of new

drugs and innovative masking solutions keeps the agencies on the backfoot. Online sale of dubious supplements is further compounding the problem.

Moreover, drug testing is typically restricted to organised, competitive sports, that too at the national/international levels. What about the possibility of inadvertent/wilful drug abuse among student athletes, not to mention ordinary consumers being lured by varied supplements to boost energy levels and exercise capacity?

The onus is on you, yes you, to prove that you can make it as a clean athlete and on every one of us to live a clean (and safe) life per se! ▶





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RESEARCH FEATURE

FIGHTING THE FALLOUT OF SUPPLEMENTS IN SPORTS



Athletes use various strategies to perform beyond their best, including sports supplements.



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HORIZON

LOOKING FORWARD TO THE NEW NATIONAL ANTI-DOPING ACT!



With the National Anti-Doping Act, 2022 just coming into force, India is primed to implement the high level of regulation and compliance needed by WADA in national and international level sports participation by our sportspersons.



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INTERVIEW



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Director and CEO of India's National Dope Testing Laboratory (NDTL)

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MY MARKET

WORKOUT AND DIETARY SUPPLEMENTS, ENERGY DRINKS - ALL TARRED WITH THE SAME BRUSH



Energy drinks and supplements may give a temporary boost, but they do much more harm than good.



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IN FOCUS

CLEANING UP THE DIETARY SUPPLEMENTS INDUSTRY WITH FSSAI REGULATIONS



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OUT OF THE BOX

THINK TWICE BEFORE BUYING SUPPLEMENTS ONLINE



There has been an explosion of e-commerce websites selling health supplements to the netizens. Scores of these online sellers are coming under the scanner due to the dubious veracity and safety of their products.

ANDREA PETRÓCZI

AN ANTI-DOPING RESEARCHER, KINGSTON UNIVERSITY, LONDON AND KU LEUVEN, BELGIUM.

Clean sport is more than just drug-free. Doping is just one form of cheating in sport. To protect sporting integrity, all unethical behaviours must be treated equally and better regulated. In fact, what our research has found is that the majority of athletes want to compete clean.



ROUNDUP

Junior athletes often point fingers at their coaches or the support staff like physios or doctors



Experts Warn of Cardiovascular Risks from Performance-Enhancing Supplements



DATA BRIEFING

India is ranked third in doping, according to the latest World Anti-Doping Agency (WADA) report released in 2021. With

152

cases across disciplines, the country is marginally below leaders Russia (167) and Italy (157).



THE EUROPEAN SOCIETY of Cardiology published a position paper in March this year outlining the adverse cardiovascular effects of some common medications, performance-enhancing supplements and doping substances. It affirms that both illegal and legal substances can have significant consequences on the heart health of athletes. They are strongly advised to seek medical advice before taking anything that could impact their performance.

This Position Paper reviews the recent literature and represents an update to the previous paper published in 2006.

The objective is to inform physicians, athletes, coaches and those participating in sport for a health enhancement purpose, about the adverse cardiovascular effects of doping substances, commonly prescribed medications and ergogenic aids, when associated with sport and exercise.

The paper lists several substances and the cardiovascular problems that can arise for some people who use them. For instance, anabolic agents can raise the risk of heart attacks, thrombosis, heart failure, coronary atherosclerosis and other cardiovascular problems. It is noteworthy that death among athletes doping with anabolic androgenic steroids is estimated to be 6 to 20 times higher than in clean athletes, with around 30% of these deaths attributed to cardiovascular causes.

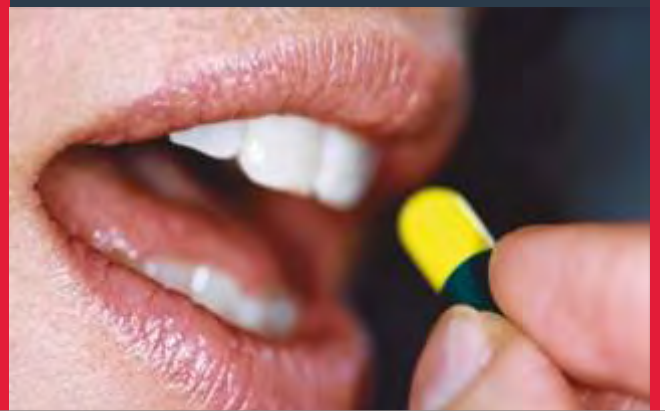
Similarly, stimulants carry the risk of abnormal heart rhythms, heart failure, heart attacks and more. Other commonly prescribed medications (such as beta-blockers, antiplatelet medications and psychoactive drugs) can also negatively affect heart health if athletes do not take them correctly. A doctor may prescribe it to treat a medical condition, but the athlete should make it a point to inquire how it may impact his/her heart when engaged in sports.

Can a Pill give you a Better Body?

Steroid alternatives - better known as selective androgen receptor modulators (SARMs) - are widely marketed as legal steroids for building muscles and gaining strength. Gym-goers and bodybuilders routinely fall for this gimmick and believe that these pills will deliver the muscle-building benefits of anabolic steroids sans their troubling side effects.

The U.S. Food and Drug Administration even issued a public advisory cautioning that SARMs are unapproved drugs linked to 'serious safety concerns' like liver toxicity, heart attacks and strokes. While research is still ongoing on the effects of such substances, why would you want to risk your health and future when there are natural ways of gaining what you want?

Keep in mind that SARMs are prohibited by WADA and many athletes have been suspended for testing positive for a SARM.





“The most important takeaway is that athletes are always personally responsible for any substances they consume. This also applies to natural supplements and substances, which are not necessarily safe,

therefore should only be used if recommended by professional nutritionists.” – First author of the paper, **Dr. Paolo Emilio Adami** of World Athletics, the global governing body for track and field

Then again, athletes are officially permitted by WADA to take vitamins, minerals and other nutritional supplements. However, adverse effects are still likely – say, when several supplements are taken together or the dosing recommendations are ignored. Especially, caffeine, nicotine and some plant supplements can cause heart problems among athletes. The paper further warns that other supplements need further testing to gauge their potential impact on heart health. Similar is the case with new options like synthetic peptides.

The paper emphasises that athletes with an existing heart ailment should always consult a sports physician or sports cardiologist prior to using any performance aid or supplement. It further advises athletes that a natural supplement is not necessarily a safe supplement and they should always use products of established manufacturers with known good quality standards. ▶



Energy Drink Kickstarts Blood Clots!

IN A JOLT to the world of health and strength, a study revealed that a popular non-alcoholic drink can spur the formation of blood clots as soon as within 60 minutes of consumption!

It was hypothesised that energy drinks increase platelet activity – as the platelet count becomes high, blood clots start forming in the blood vessels. And as we very well know, blood clots can be the harbinger of other serious complications in the brain, heart and beyond. The same

clots can prove to be life threatening if not treated quickly.

The study was conducted in USA on 32 healthy volunteers aged 18 to 40 years. They were given 16 oz of bottled water or a standardised, sugar-free energy drink on two separate occasions, one week apart. These were consumed after an overnight fast over a 30minute period.

The researchers measured the coagulation (clotting) parameters and platelet function before and one hour after consumption. The study did not detect any statistically significant differences in coagulation. However, energy drink consumption caused a substantial increase in platelet aggregation as compared to water within one hour of consumption!

Those who would still prefer to consume energy drinks are advised to stay active and drink plenty of water to avoid dehydration!

It was concluded that, “Although larger clinical studies are needed to further address the safety and health concerns of these drinks, the increased platelet response may provide a mechanism by which energy drinks increase the risk of adverse cardiovascular events.”

Symptoms of a blood clot

- Throbbing or cramping pain, swelling, redness and warmth in the arm or leg
- Sudden breathlessness, sharp chest pain and a cough or coughing up blood. ▶

Why you need to find better ways to get a boost than energy drinks

- A viral Tiktok video claims that the user developed early onset heart disease after drinking energy drinks every day for two years. This was corroborated by the American Heart Foundation!
- The number of energy drink-related emergency department visits in USA doubled from about 10,000 in 2007 to about 20,800 in 2011. More than 10 years on, the numbers can be mind-boggling!
- A cardiologist dubbed energy drinks as 'cardiac death in a can'!





Could Indian Athletes Camping Overseas Be Bringing Back Performance-Enhancing Drugs?

SENIOR VICE-PRESIDENT OF the Athletics Federation of India (AFI), acclaimed coach and legendary long jumper, Anju Bobby George recently alleged that some athletes get performance-enhancing drugs from abroad and distribute among their colleagues!

"Many banned drugs being taken by the athletes caught for doping are not available in India, they come from abroad," said Anju, winner of a long jump bronze medal at the 2003 Paris World Championships, at the recent annual general meeting of AFI.

AFI President Adille Sumariwalla urged athletes to stop taking drugs and claiming innocence later on, "I had recently met with NADA people and they are going to test more samples. They have recruited 115 dope testing officers and they are going to district and state level meets besides the national level events... We have urged the NADA to conduct dope testing at the junior meets, district, state and departmental level meets also. I am telling the athletes; you will get caught someday and stop this 'dhanda' (business)."

Sport Ministry Proposes to Sign MoU with NFSU, Gujarat

THE GOVERNMENT OF India is driving the initiative to ensure safe usage of dietary supplements by sportspersons. The Ministry of Youth Affairs and Sports will soon sign a MoU with National Forensic Science University, Gandhinagar, Gujarat.

This is a great initiative for minimising the risks in this relatively untouched area that is not only leading to suspensions and bans of our athletes but also endangering their health in different ways. NFSU will be creating testing facilities for dietary supplements that will be funded by the Ministry.

NFSU is the world's first and only university dedicated to forensic, behavioural, cybersecurity, digital forensics and allied sciences. It was established by the Government of India in 2020 with the objective of fulfilling the acute shortage against the increasing demand for forensic experts in the country and around the world. ▶



Consumers, Beware

Don't Let Unintentional Doping Become the Bane of Your Career!

While doping in sports is an abominable and unacceptable proposition, can we discount the fact that some innocent sportspersons get caught in the web for no apparent fault of their own?



LAST YEAR, FREESTYLE wrestler Sumit Malik (125kg category) lost his place in the Tokyo Olympics 2021 when he tested positive for the prohibited stimulant methylhexaneamine.



His claim that he had taken painkillers to manage a knee injury that he sustained at a national training camp prior to the Asian Olympic qualifiers in Almaty fell on deaf ears as the United World Wrestling (UWW) banned him for two years!

A study was carried out for 18 years by Anti-Doping Norway to determine the relationship between the presence of prohibited substances in athlete's doping samples and the use of dietary supplements. It was concluded that the 26% of all the analytical anti-doping rule violation cases in the period 2003–2020 (n = 192), the athlete claimed that a dietary supplement was the source of the prohibited substance causing a

positive test finding (Ref. Fredrik Lauritzen, *Frontiers in Sports and Active Living*, 2022).

It cannot be denied that scores of athletes deliberately cheat by taking prohibited drugs to enhance their performance. While most of them deny the allegations and assert inadvertent use, there are a handful who genuinely fall into the trap, having unknowingly consumed something that contained a prohibited substance! While some bans are overturned later, most never get back their title or even their chance at the sport. Alas, all the years of hard work and sacrifice are wiped out just like that and the sportsperson has to live with the humiliating disgrace forever!

A doping offence occurs when a sportsperson tests positive for a prohibited substance, regardless of how it got there!

How Does This Happen?

Sports are physically intensive and exacting. The energy and protein requirements of athletes surpasses that of regular people and cannot be fulfilled by the dietary intake alone. They follow a relevant foodregime and take specific dietary supplements, which is essential for the better recovery between trainings and

competitions. They have to take dietary supplements to compensate for the same. Additionally, they also require sports medicines on a regular basis to combat pain, injury and illness. Furthermore, athletes often have no choice but to take steroid medications to treat diseases and other health conditions. A risk is usually associated with the use of dietary supplements is the risk of unintended doping—originating from contaminated products.

Now the fact remains that everything from vitamins and minerals tablets to painkillers, decongestants and other common medications may contain some substances that have been prohibited by the World Anti-Doping Agency (WADA). Then there is the nuisance of changes in ingredients in regular medicines from one country to another – A British skier had to bear the cross of naively using a Vicks inhaler in USA without knowing that it contained the prohibited drug levomethamphetamine which is absent in the English counterparts!

Even when the wary sportspersons diligently read the product labels, the manufacturers may shroud some of the ingredients in unapproved names or avoid declaring them at all! A common example being Strychnine- a natural alkaloid of Nux vomica plant prohibited in sports, is present in many herbal drugs/preparations with different names like Shuddha Kapilu, Kuchla Shudd, Ramyaphal and Strychnous nux vomica.

That's not all! Traces of growth hormones and other medications injected into animals are known to find their way into humans when we consume meat, eggs, etc. Many herbal preparations and natural medicines often contain animal tissues that will have endogenous hormones and other such substances. To top this, sportspersons may even end up unwittingly consuming foods that are laced with a prohibited chemical or drinking something that has been spiked.

Not to mention the risks of passive inhalation of cannabis or other smoke when in the vicinity of other users...

Prohibited substances	Routes of administration
Clenbuterol	Medicine
	Food
	Supplement
Anabolic prohormones	Supplement
Cocaine	Recreational
Amphetamine	Recreational
Ephedrine	Medicine
	Supplement
Methylhexaneamine and other stimulants	Supplement
Cannabinoids	Recreational
	Food
	Passive inhalation

Common prohibited substances that may be taken inadvertently and the potential routes of administration (Source: *Aspetar Sports Medicine Journal*)

It is each athlete's personal duty to ensure that no prohibited substance enters his or her body

As sportspersons are subject to routine anti-doping tests without any prior notice -both within and out of competition - it often happens that the shocking results stagger and confound them no end. And all it takes is one positive report for all their efforts to go down the drain.

The WADA Stance

The World Anti-Doping Agency (WADA) is the global regulatory body for anti-doping and its Code is the core document that governs the anti-doping system. While the authorities are well aware that many athletes don't even know that the food, drinks, supplements or medications they consume contain prohibited performance-enhancing drugs and may take something purely by accident, they are willing to sacrifice a person to protect the sanctity of the sport!

WADA has a zero tolerance policy when it comes to athletes claiming that they accidentally or unintentionally ingested prohibited substances. The 2021 WADA Code (Article 2.1.1) states, "It is each athlete's personal duty to ensure that no prohibited substance enters his or her body. Athletes are responsible for any prohibited substance or its metabolites or markers found to be present in their samples. Accordingly, it is not necessary that intent, fault, negligence or knowing use on the

athlete's part be demonstrated in order to establish an anti-doping rule violation." In other words, the authority does not distinguish between deliberate cheating and inadvertent doping!

Going by this principle of strict liability, the onus is on the athlete to prove the unintentional or negligent way the prohibited substance entered his or her system. And the disciplinary committee needs strong, non-circumstantial evidence of the inadvertent contamination or other no-fault reason before it will even consider exonerating/reducing the sanctions.

A More Rational Approach

Sportspersons have to be extremely vigilant and exercise due diligence at every step. They should never ever self-medicate or use over-the-counter medications even for the simplest of health conditions. As a rule, always consult the physicians and coaches who are trained and conversant with the WADA regulations.



SATHISH SIVALINGAM

The same rule of caution applies to food products as well. As Sathish Sivalingam, champion weightlifter and two-time Commonwealth Games gold medallist exhorted, "I am glad and grateful to my mother for educating me to be careful in not having even a cup of coffee outside since I would be responsible for everything that went into my body", while explaining to young athletes how simple mistakes can lead to disastrous results in case of contamination in the food or beverage.

Conclusion

The athlete is wholly and solely responsible for what enters his or her body. The risk of accidental contamination is omnipresent and has to be tackled with awareness! ▶



Saina Nehwal
former World No. 1
badminton player

You must be very careful about the medicine before consuming it. I always get my medicines checked by the official doctor even if I am suffering from a minor cold or fever.

It should be noted that since many of the WADA-prohibited drugs figure in the prescribed treatment for asthma, diabetes, cardiovascular disorders and sports injuries, the athlete can apply for a 'Therapeutic Use Exemption' beforehand to support that the said drug is being used for genuine health concerns! The procedures for applying for and granting a TUE are outlined in the International Standard for TUEs (ISTUE) guidelines and are available on WADA website.



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FIGHTING THE FALLOUT OF SUPPLEMENTS IN SPORTS

Athletes use various strategies to perform beyond their best, including sports supplements. But all of them may not be effective, safe or legal. Countries across the world have come together to invoke some common anti-doping legislation and testing protocols to deter the unfair and unhealthy practices that are tarnishing the sanctity of sporting.





world anti-doping agency

Growing international efforts to counter the effects of performance-enhancing substances in sports culminated in the establishment of WADA as a supreme international authority.

THERE ARE CERTAIN individuals who are blessed with the talent and genetic endowment to perform well in a particular sport. They refine these naturally enhanced abilities with optimal training to increase their power and capacity to excel at the sport.

Indeed, sportspersons are constantly training, practicing and competing with each other. This involves intense muscular efforts which expends a lot of energy. They need some nutritional supplements to improve their energy levels, exercise performance capacity, enhance recovery from exercise and remain healthy. There are a host of supplements that are considered safe, legal and effective in improving performance in sport-specific situations and are backed by evidence-based protocols. This becomes a convenient source of nutrients that is lawful to use as well.

While the use of dietary supplements is widespread among athletes globally, not all of them are safe or even accepted by the sporting community!

Then again, every sport has its share of unscrupulous athletes who will go to any length to win. Some of them attempt to go beyond training and resort to certain substances that augment their abilities beyond the ordinary. This is the consumption of pharmacological agents, like performance enhancers, that boost their stamina and recovery to the extent that it gives them an unseen advantage over their opponents.

In fact, the use of substances to improve performance is likely as old as competitive sport itself. It is reported that Greeks ingested

mushrooms, herbs, wine and even animal testicles in the 3rd century BC to improve athletic performance.

Gladiators in the famed Circus Maximus also used stimulants to fight despite fatigue, pain and injury.

Termed as doping in the modern world, this has become a matter of grave concern for the authorities and sports institutions across the world. Formal drug testing to check doping was first introduced in the 1968 Olympic Games.

WADA - The Global Doping Watchdog

Given the scope of the doping problem and the dangers it can cause to the health and well-being of athletes and young people generally, the International Olympic Committee (IOC) initiated the creation of an independent federation known as the World Anti-Doping Agency (WADA).

This was on the heels of an enormous doping scandal that shook the world of cycling in 1998.

WADA was established in November 1999 with a mission to promote, coordinate and monitor the fight against doping in sport internationally. The WADA Foundation Board is jointly composed of representatives of the Olympic Movement (the IOC, National Olympic Committees, International Sports Federations and athletes) and representatives of governments from all five continents. The headquarters are in Montreal, Canada with regional offices in other countries. WADA is recognised by the UNESCO International Convention against Doping in Sport (2005).

WADA perseveres to protect athletes, promote the values of clean sport, and preserve the spirit of sport internationally.

WADA is the leading authority of global anti-doping



Vision

- A world where all athletes can participate in a doping-free sporting environment

Roles

- To regulate anti-doping organizations and the anti-doping system.
- To enable the development of the anti-doping system and programs.

Mission

- To lead a collaborative worldwide movement for doping-free sport



The WADA Code

The World Anti-Doping Code (Code) by WADA first took effect in 2004 as a regulatory instrument that forged worldwide sport consensus and has been adopted by around 700 sport organisations covering over 200 countries across the world.

This has become the core document that harmonises anti-doping policies, rules and regulations within sport organisations and among public authorities in all sports and all countries. It works in conjunction with eight International Standards published by WADA (covering prohibited substances, testing and investigations, laboratories, Therapeutic Use Exemptions, etc.) which aim to foster consistency among anti-doping organisations in various areas.

The WADA Code defines ten Anti-Doping Rule Violations (ADRVs) by which an individual might be found in violation. The definition of 'doping' is to have violated the Code and being found guilty of an ADRV. This definition of doping in the World Anti-Doping Code has been accepted as the international standard since 2004.

What is Doping?

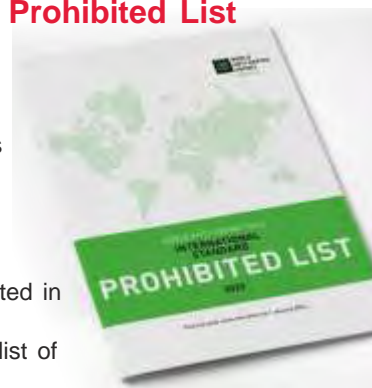
Doping isn't simply a positive test. It is defined as the occurrence of one or more of the following Anti-Doping Rule Violations (ADRVs):

- Presence**
 - prohibited substance, its metabolites or markers in an athlete's sample
- Use or attempted use**
 - prohibited substance or method by an athlete
- Refusing**
 - evading or failing to submit to sample collection by an athlete
- Failure**
 - whereabouts information and/or missed tests by an athlete
- Tampering or attempted tampering**
 - with the doping control process by an athlete or other person
- Possession**
 - prohibited substance or method by an athlete or Athlete Support Personnel (ASP)
- Trafficking or attempted trafficking**
 - prohibited substance or method by an athlete or other person
- Administering or attempting to administer**
 - prohibited substance or method to an athlete
- Complicity or attempted complicity**
 - in an ADRV by an athlete or other person
- Prohibited Association**
 - by an athlete or other person with a sanctioned ASP
- Acts**
 - to discourage or retaliate against reporting to authorities.

The Code serves as a framework for anti-doping policies, rules and regulations for sport organisations and public authorities so that there may be a level playing field for all athletes worldwide. It has been revised a couple of times over the years with a view to making the tool stronger and more robust in protecting the rights of clean athletes worldwide. The most recent version came into effect from 1st January, 2021.

The WADA Prohibited List

WADA also publishes a Prohibited List which serves as the international standard for identifying substances and methods prohibited in sport. This comprehensive list of



WADA ensures proper implementation of the Code and its Standards, conducts investigations into doping incidents, conducts research on doping and educates sportspersons and related personnel on anti-doping regulations.



WADA already bans the use of genetically modified cells and gene therapy if they have “the potential to enhance sport performance”

prohibited substances and methods is updated by WADA on an annual basis following an extensive consultation process to reflect any scientific developments with respect to newly discovered substances that are deemed to represent drug cheating. The new List takes effect on 1st January every year.

The List groups substances and methods by those that are:

- **Prohibited at all times (in and out of competition)** – including anabolic agents, peptide hormones/growth factors and its mimetics including erythropoietin (EPO), beta-2 agonists, hormone and metabolic modulators, diuretics & masking agents along with methods viz., 1) Manipulation in blood and its components eg., like blood transfusion or manipulation, or intravenous injections in some

In case an athlete has a legitimate medical reason to use one of the prohibited substances/methods, a Therapeutic Use Exemption (TUE) may be granted after extensive review.

situations 2) Chemical and physical Manipulation 3) Gene and cell doping

- **Prohibited in-competition only** – including stimulants, narcotics, Cannabinoids and Glucocorticoids
- **Prohibited by a particular sport** – including beta-blockers

A substance or method that is not expressly named on the Prohibited List is also deemed so if:

- It has a similar chemical structure or similar biological effect(s)
- It is not currently approved by any governmental regulatory health authority for human therapeutic use

Note: The list of prohibited drugs does not touch on nutritional substances as many of them are unregulated and unlicensed. Some of the legal supplements include caffeine, creatine, energy drinks/gels/bars, beetroot juice and proteins, but many may still have side effects.

Drug testing is the scientific tool used by anti-doping organisations to level the playing field by checking whether competitive-level athletes are clean.

The Code expressly states that athletes competing at the national or international level are subject to doping control and can be tested anytime or anywhere – both in competition and out of competition. They can be tested by relevant National Anti-Doping Organisations (NADOs), International Federations (IFs) and Major Event Organisations (MEOs). The standard procedure for dope testing is as follows:

- The athlete will be notified that he/she has been selected for doping control (testing) and the ADO authority under which they are being tested.
- The athlete must report to the doping control station immediately.
- The athlete will choose a urine sample collection vessel/blood collection kit from a selection made available by the doping control personnel, as applicable.
- A doping control officer (DCO) or chaperone will witness the passing of the urine sample when the athlete is ready to provide it. A blood collection officer (BCO) will draw blood from the athlete using two vials.

- The athlete will divide their urine into the A and B bottles while saving a residual amount of urine in the sample collection vessel. In case of a blood sample, the vials will be placed in the A and B blood sample collection bottles. (The B sample affords the athlete the opportunity to have a second analysis in case the 'A' sample returns an adverse (positive) analytical finding)
- The athlete will seal the A and B bottles.
- The DCO will measure the specific gravity of the athlete's urine to determine whether it meets laboratory standards. If the sample is too diluted, the athlete will be asked to provide additional sample(s).
- The athlete will complete the Doping Control Form (DCF) by providing personal information, a list of substances or methods used, and any comments related to the doping control process.
- The athlete's sealed sample will be secured and sent to a WADA-accredited laboratory. The laboratory copy of the DCF that accompanies the sample is anonymized, indicating only the sample bottle number, sport and the athlete's gender.

If the result returns positive for any prohibited substance, the athlete is liable to not only be disqualified but may also have to forfeit all medals, points and prizes. This ruling does not extend to other competitions that the athlete participated in unless it is established that the same drug was used to alter the performance capability in the other competition as well. In some cases, the athletes may even be stripped of world titles - like professional cyclist Lance Armstrong who publicly admitted on the Oprah Winfrey show that he used drugs for many years to beat the competition!

As for team sports, in case two or more members of the team are found to be in violation of the anti-doping

code, the entire team could forfeit points and prizes and be disqualified.

Additionally, WADA also imposes significant sanctions which can range from a two to four year ban from all competition for athletes who test positive on a doping test for the first time. This ineligibility bars the athlete from participating in any international or national sporting event whose organiser is a signatory to the WADA Code.

The penance mechanism in various countries covers fines, bans and divesting of achievements. Some even consider doping a criminal offence and athletes who test positive in doping face imprisonment. The penalties are designed to both deter athletes from resorting to underhand measures as

The importance to the global anti-doping system of having a collection of high-quality laboratories cannot be overstated

well as to punish those who are found to have done so even while offering them opportunities for rehabilitation.

WADA Research

Every year WADA funds varied scientific research projects to identify new trends in doping and emerging challenges like new drugs and delivery mechanisms along with new methods of detection.

WADA tests blood and urine samples from several hundred thousand Olympic athletes every year, of which 1% to 2% tend to test positive for prohibited substances. Measures using the Athlete Biological Passport suggest a higher mean prevalence of about 14% positive tests. However, the global agency is well aware that the incidence is more widespread and a majority of the athletes still manage to get away with

such unethical practices.

WADA commissioned a survey in 2017 to estimate the actual prevalence of doping which returned some shocking results. 2167 athletes at two international track and field competitions were covered to determine the probability that an athlete was doping. The estimated prevalence of past-year doping (as an average of the two international competitions covered by the survey) was 43.6%. The estimated prevalence of past-year supplement use was 70.1%.

Another study of top German cyclists and field athletes in 2018 reveals that better detection and diagnostics along with increased bans and laws against doping are perceived as far more effective than increased fines or leniency programs for offenders who cooperate in the identification of other offending athletes.

Another 2022 study aims to understand the systemic issues in the implementation of the Code in developing countries from an Indian perspective. It lays out the lack of harmonisation in the implementation of the Code across countries and the impact it has on the legitimacy of the anti-doping framework. The results highlight the need to conduct a deeper analysis with respect to how different countries implement the Code, and how the Code impacts athletes from different countries.

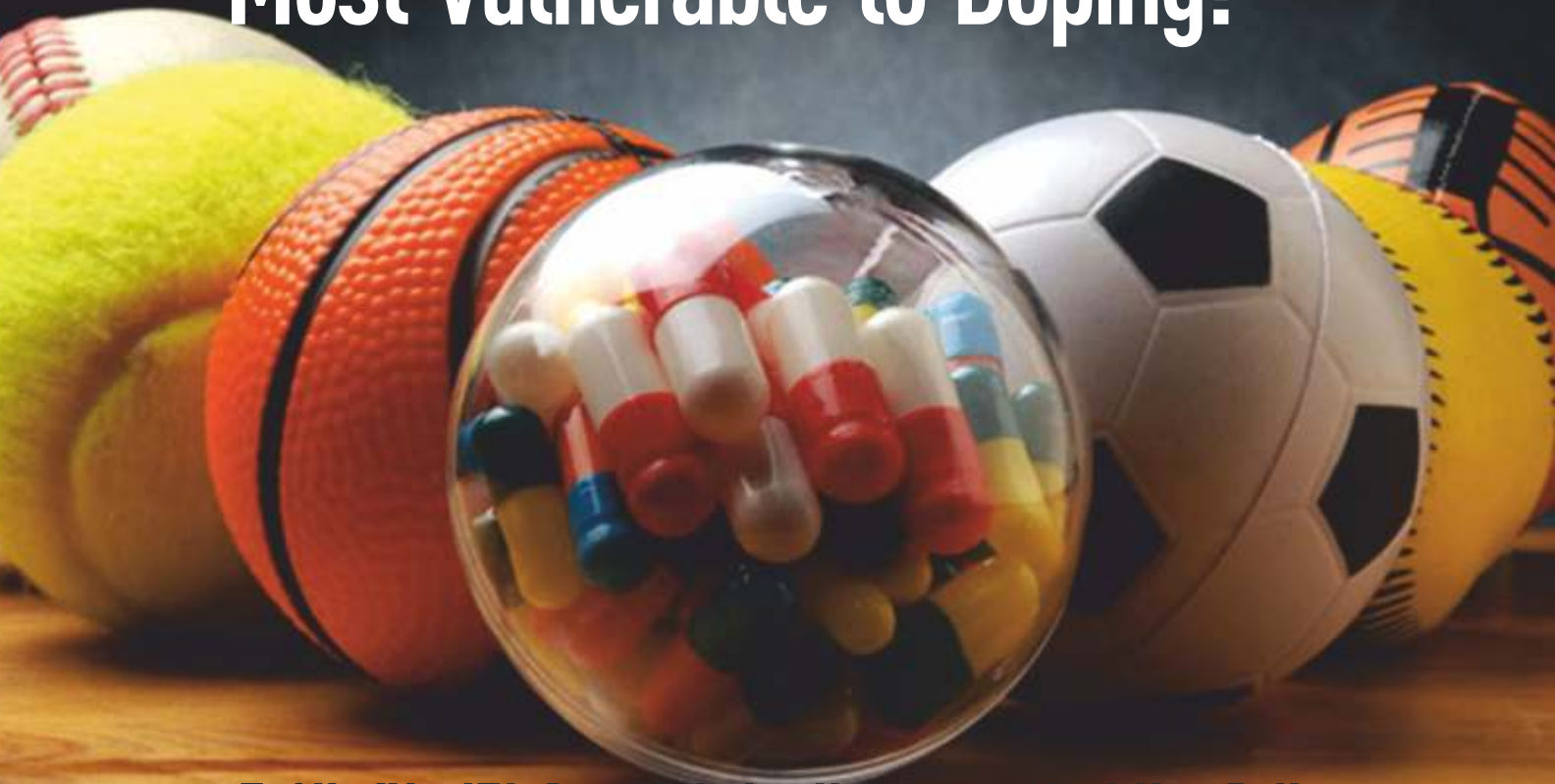
Moreover, it is obvious that drug testing and controls are restricted to organised and competitive sports only. However, numerous studies underline that misuse of doping agents is rampant in recreational sport too. This is both a societal problem and a public health issue that must be addressed!

Conclusion

Doping is anathema around the world. Sustained efforts are being made on an ongoing basis to ensure that sports remains an honourable quest for perfection! ▶

WADA Survey

Supplements Render Athletes Most Vulnerable to Doping!



The Athlete Vulnerabilities Research Project is a critical component of the priorities outlined in WADA's Strategic Plan, 'Leading Anti-Doping in a New Era: 2020-2024'

Athletes start with a clean slate and most of them intend to compete clean throughout their careers. However, certain factors can increase their vulnerability to dope. A recent report by WADA sheds light on the doping vulnerabilities, motivations, sources of knowledge and related behaviours and beliefs of the athletes. This will help the concerned authorities plan and implement the right education programs or other interventions to prevent doping.

A RECENT WADA (World Anti-Doping Agency) research survey reveals that supplements are considered the major cause of vulnerability among athletes to doping! The survey forms a crucial part of WADA's Athlete Vulnerabilities Research Project that was released in March 2022.

Conducted from April to June 2021 in collaboration with Canada's Université de Sherbrooke Research Chair on Anti-Doping in Sport, the survey covered 574 respondents (219 athletes and 355 sport organisation personnel) from 85 countries and 59 sports in total. The results were endorsed by WADA's Education Committee and Social Science Research Expert Advisory Group.

The primary objective of the study was to gather insight from those engaged in sport as to the types of athletes who may be more vulnerable to inadvertent or intentional doping and the factors that contribute to their vulnerability. The results will allow national and international federations to be more proactive in their protection of vulnerable athletes. They will also help WADA identify specific areas for further investigation and research.

Factors that Increase Vulnerability to Doping

Athletes and sport personnel identified nine vulnerability factors as 'most important' from a list of 35 options. (see Figure 1) While both categories of respondents agreed on a number of these vulnerabilities, the major point of

difference is that the former are far more likely to consider the use of nutritional supplements responsible for increasing athlete vulnerability (particularly medical personnel) with almost 50% nominating this factor.

On the other hand, the same nutritional supplements figured 6th on the vulnerability factor scale for athletes and was nominated by just under 20% of them. The athletic community seems to rest the blame more on the need for rapid physical development, negative social environment and health conditions.

This stark variance highlights the fact that athletes are still quite unaware of the risks of supplement use. The results also underscore the need for education programs covering a broad range of topics and extending support to athletes through varied means.

Risk of Doping at Each Stage Along Athlete Pathway

Both sport personnel and athletes consider international-level athletes (both male and female) to be at the highest risk for doping. In general, the risk is perceived to increase as the athlete advances up the stages. Additionally, male athletes are deemed to be more at risk for doping than their female counterparts. (see Figure 2a and 2b).

Furthermore, when it comes to the risk of inadvertent doping along the athlete pathway, the results show that a pronounced risk is perceived at almost every stage. (see Figure 3). This indicates a need for education on the risks of inadvertent doping and how to develop

Figure 1: Perceived 'Most Important' Doping Vulnerability Factors by Respondent Type

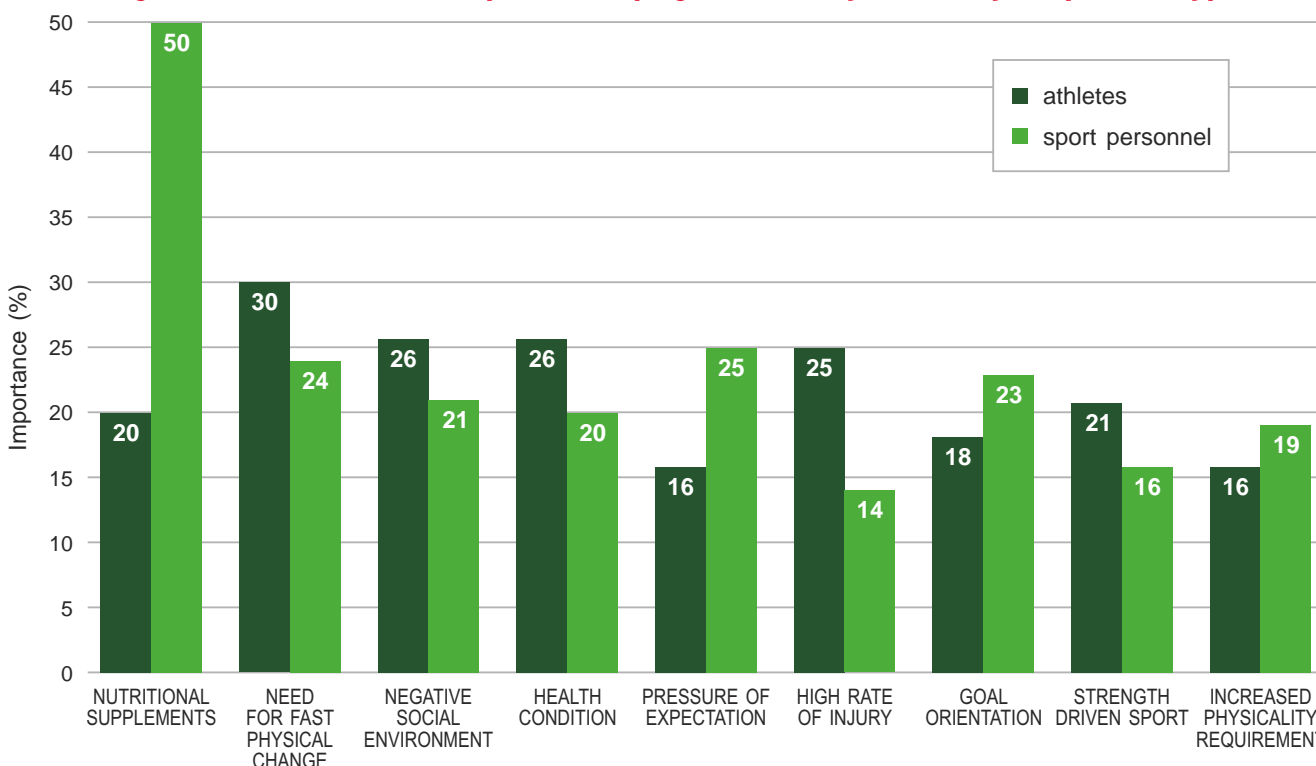


Figure 2a: Perceived Risk of Doping by Male Athletes at Each Stage Along Athlete Pathway

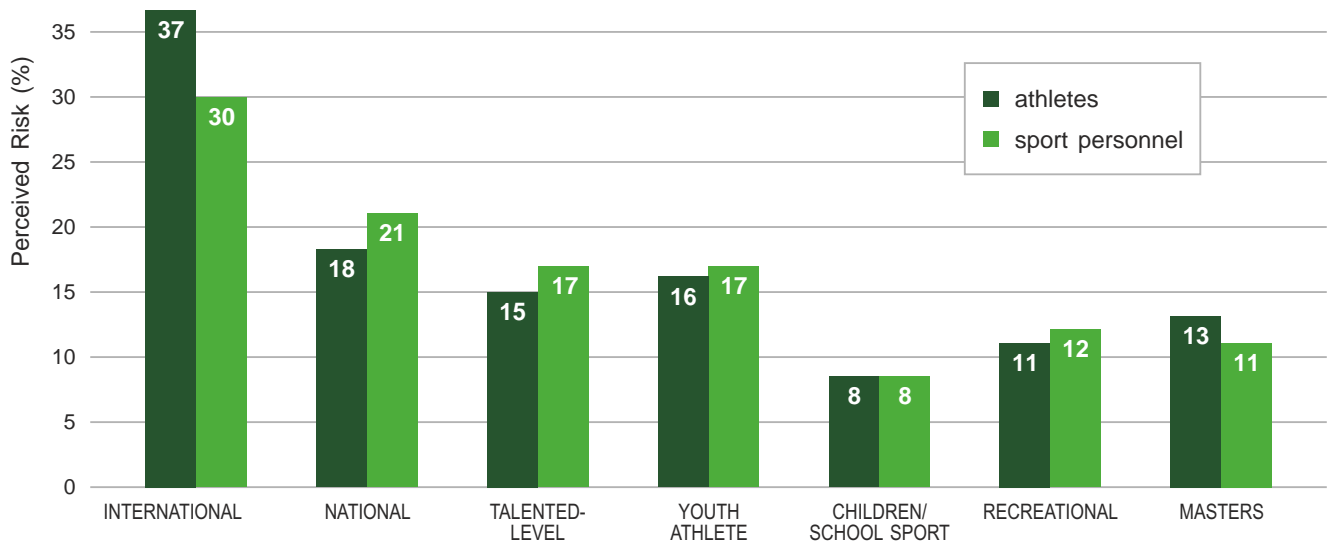


Figure 2b: Perceived Risk of Doping by Female Athletes at Each Stage Along Athlete Pathway

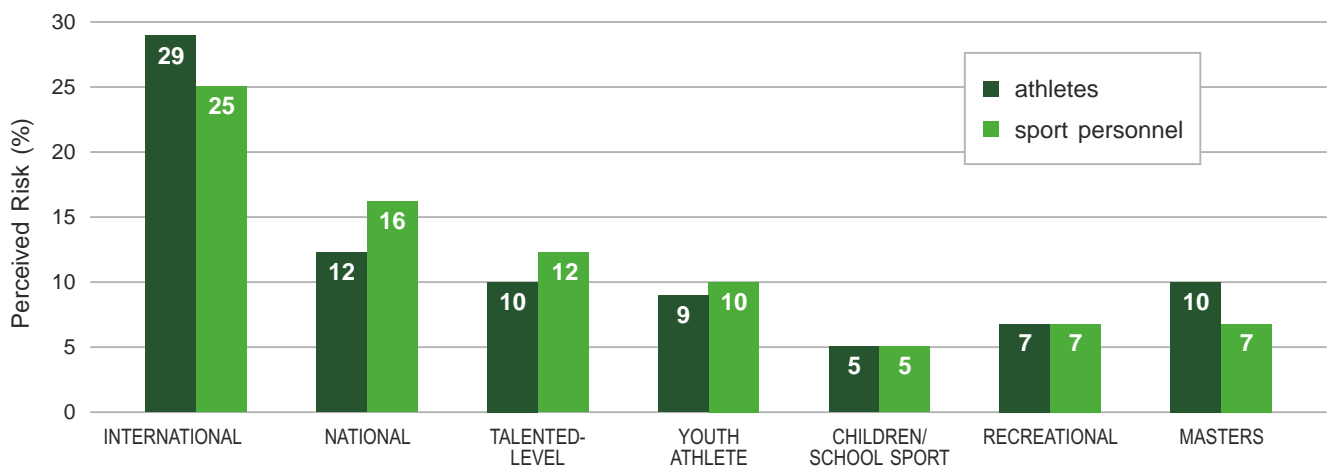
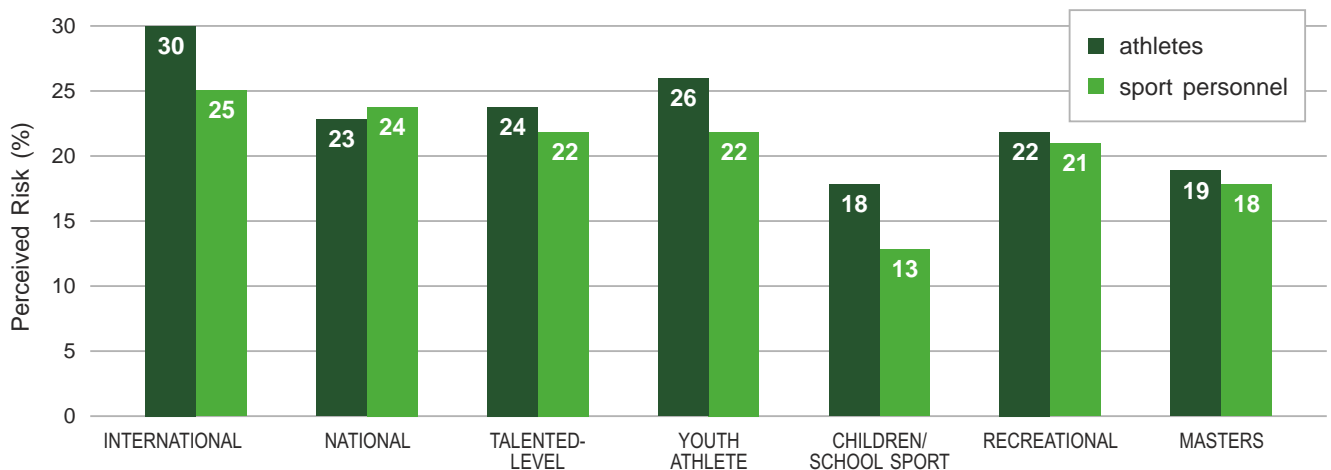


Figure 3: Perceived Risk of Inadvertent Doping by Athletes at Each Stage Along Athlete Pathway



behaviours to mitigate such risks at all stages of the athlete's career.

Most Relevant Motivations for Doping by Athletes in Their Sport

The survey respondents were given a list of nine doping motivations and the results show that most sport personnel and athletes consider all of them as relevant. (see Figure 4) And with performance enhancement being consistently nominated as the most relevant motivation, it is important to understand why athletes want to improve

their performance, beyond winning, and what drives them to dope to do that.

The focus should be on identifying other reasons why athletes might dope, and addressing them when planning and delivering education as well as wider anti-doping strategies.

Athletes' Doping Knowledge

In general, the respondents believe that athletes have 'good' or 'advanced' knowledge of each of the eight anti-doping concepts listed by the survey. (see Figure 5)

Figure 4: Perceived Most Relevant Doping Motivations

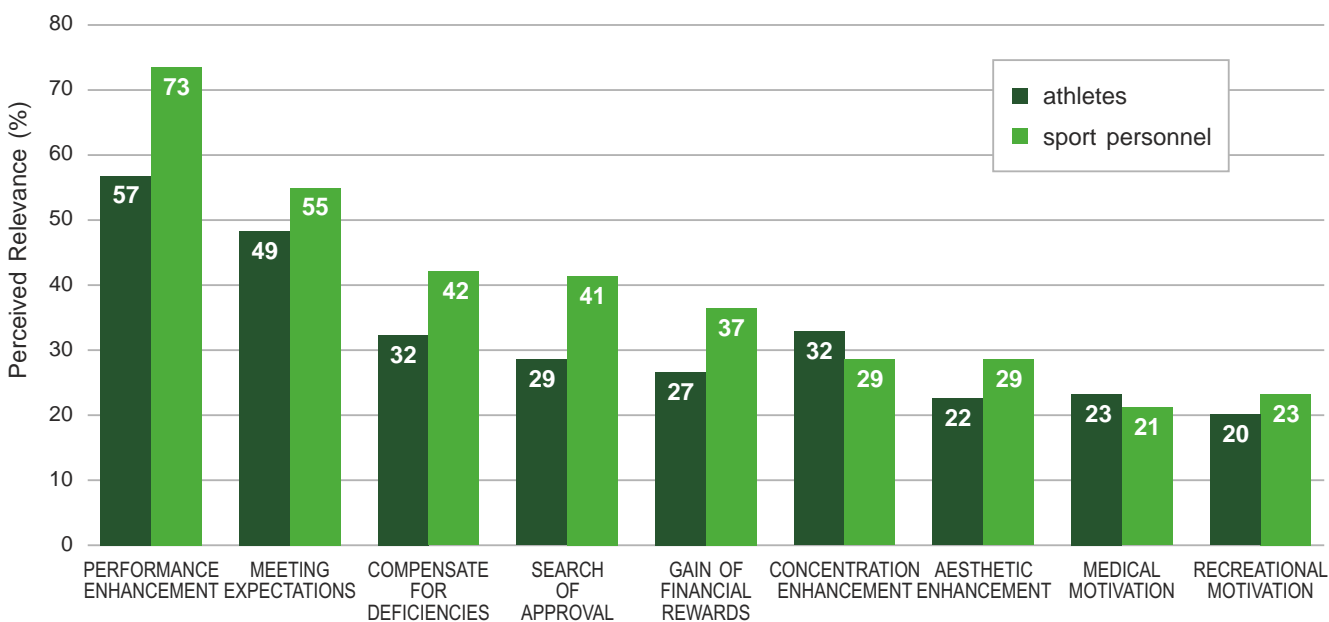
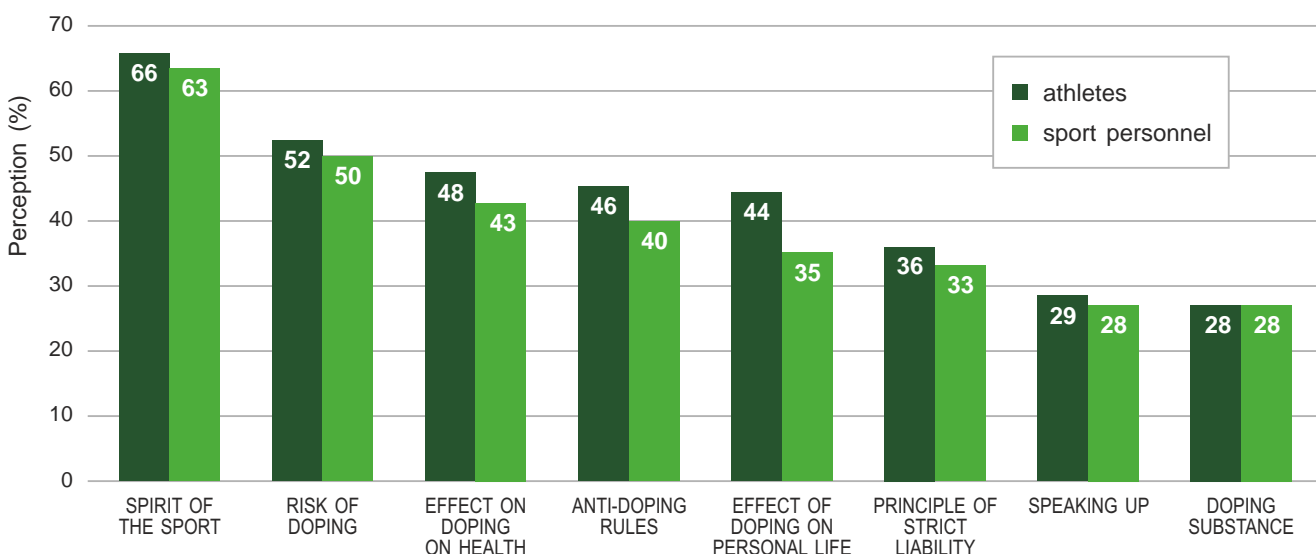


Figure 5: Perceived 'Most advanced knowledge' by Respondent Type





The spirit of sport is expressed in how we “play true”. Doping is fundamentally contrary to the spirit of sport.

Figure 6: Perceived Most Consulted Source of Information by Athletes

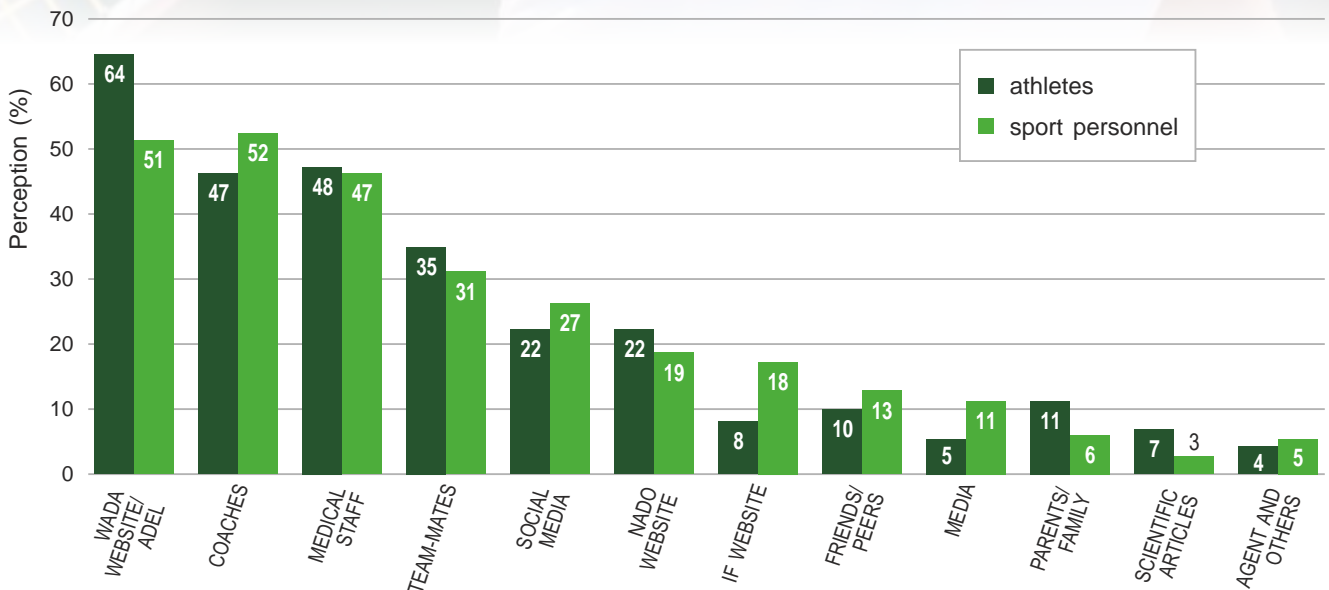
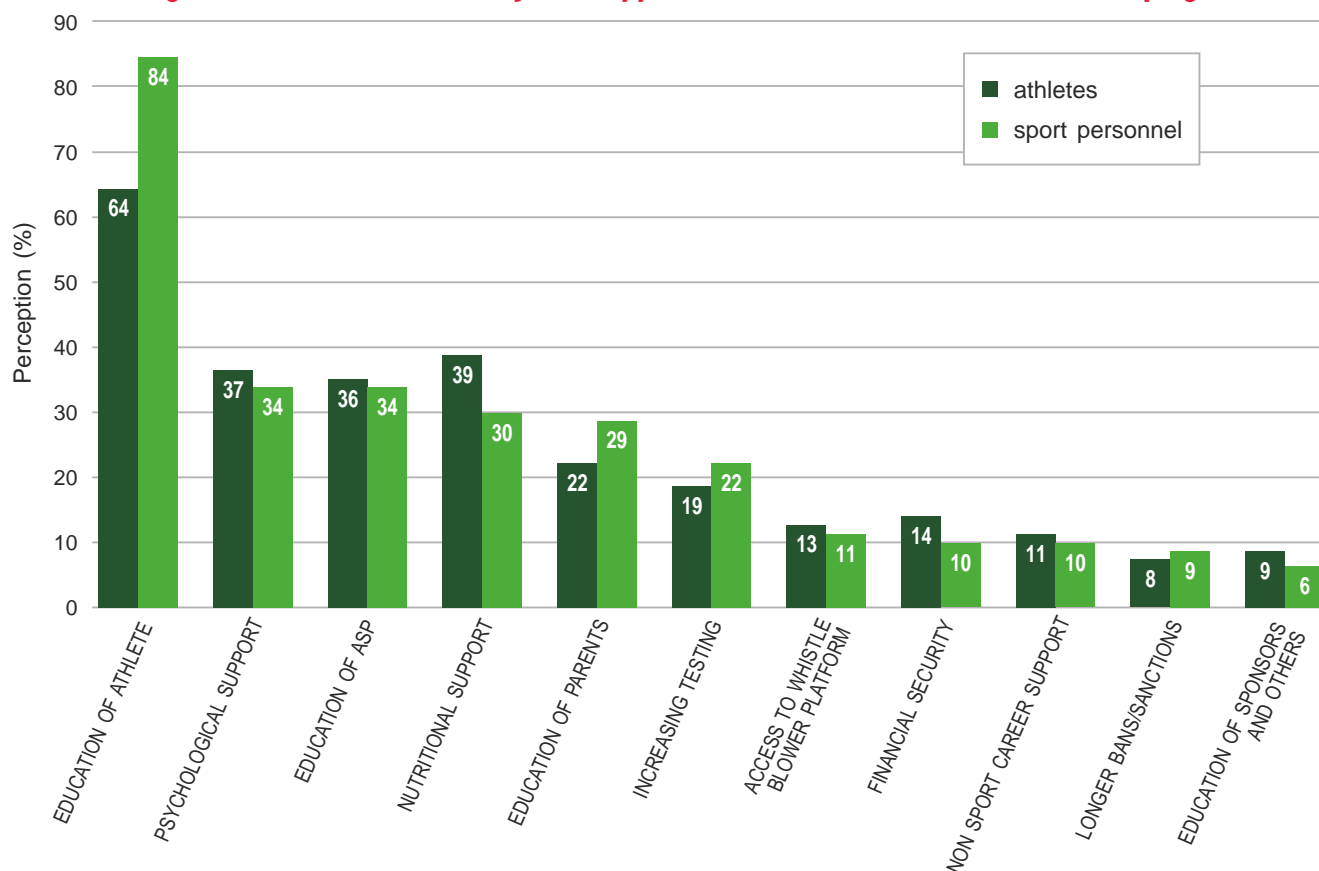


Figure 7: Perceived Best Ways to Support Vulnerable Athletes to Prevent Doping



However, it should be noted that only around half of both sport personnel and athletes rated knowledge of the 'risk of doping' as 'good' or 'advanced'. The numbers were even lower for the 'effect of doping on health'.

Sources of Information About Anti-Doping

WADA happens to be the most common source of information by athletes and second most common by sport personnel. (see Figure 6) However, coaches were deemed to have the most influence on athletes at all stages of the pathway, particularly at the elite levels. This indicates that coaches also need education programs that will provide them with accurate, up-to-date information and advice they can pass along to their athletes. Additionally, this highlights that coaches are best placed to identify vulnerable athletes and can intervene, if given the tools and strategies to do so.

Ways to Support Vulnerable Athletes to Prevent Doping

Education is considered the most effective way to support athletes who may be vulnerable to doping by both sport personnel (84%) and athletes (64%). Support beyond

traditional education programs, such as nutritional and psychological support is also considered imperative. (see Figure 7)

Prof. Robert Donovan, Chair of WADA's Social Science Research Expert Advisory Group said, "A better understanding of what makes athletes vulnerable to doping, and how to support them, constitutes a major contribution to the prevention of doping and the promotion of Clean Sport behaviours."

In Phase 2 of the project, WADA will look specifically at a sport-by-sport profile of athlete vulnerabilities in order to have a more nuanced view of this topic and useful educational intelligence for sport federations to be in a more informed position to support vulnerable athletes.

Meanwhile, the global doping watchdog also continues to raise awareness of Athlete Vulnerabilities through different mediums and channels such as conferences, webinars and the development of resources.

Conclusion

Athletes dedicate a major part of their lives preparing for delivering peak performance in their careers. A tiny misstep – be it intentional or unintentional – can jeopardise years of suffering and sacrifice. Providing them with all the necessary information and support is vital! ▶

Looking Forward to the New National Anti-Doping Act!

With the National Anti-Doping Act, 2022 just coming into force, India is primed to implement the high level of regulation and compliance needed by WADA in national and international level sports participation by our sportspersons. Effective implementation will enable India to emerge as a clean and honourable sporting powerhouse!

A photograph of a syringe and several pills on a table. The scene is lit with blue and purple light. In the foreground, there are two accessibility icons: a person in a wheelchair and a person with a white cane. A large black circle is overlaid on the right side of the image, containing the text 'SAY NO! TO DOPING' in green and white.

**SAY NO!
TO DOPING**

“This is a landmark occasion when India joins the select group of around 30 countries which have their own Anti-Doping Law. The making of this law will send a strong message to the world that India is very serious about sports, sportspersons and tackling doping.”

Anurag Thakur
Union Minister of Youth Affairs and Sports

AROUND TWO YEARS back, young and upcoming cricketer, Prithvi Shaw failed a BCCI drug test and was handed a suspension of eight months. His urine sample tested positive for Terbutaline, a drug which is prohibited both in and out of competition by WADA (World Anti-Doping Agency). The cricketer accepted the charge but asserted that the violation was inadvertent as he had simply taken an over-the-counter cough syrup for his respiratory tract infection. The cricketing authority was satisfied with the explanation, yet, Shaw had to serve half the period of ineligibility which ruled him out of India's home series against Bangladesh and South Africa!

To avoid instances like this by spreading awareness among sportspersons as well as to protect the sanctity of organised sporting, the Union Youth Affairs and Sports Ministry had initiated the National Anti-Doping Bill last year. This got the assent of Parliament on 3rd August, 2022 and was notified on the 12th of the same month.

The new Act is designed to give effect to the United Nations Educational, Scientific and Cultural Organisation (UNESCO) International

Convention against doping in sport, to which India is a signatory.

The salient provisions of the Act relate to:

- Protecting rights of all sportspersons
- Ensuring time-bound justice to athletes
- Enhancing cooperation among agencies in fighting doping in sports
- Reinforcing India's commitment to international obligations for clean sports
- Instituting an independent mechanism for anti-doping adjudication
- Providing legal sanctity to National Anti-Doping Agency (NADA) and National Dope Testing Laboratory (NDTL)
- Establishing more Dope Testing Labs
- Building institutional capabilities in anti-doping and enabling hosting of major sports events
- Creating job opportunities, both directly and indirectly
- Creating opportunities for academic research, science and manufacturing relating to Anti-Doping
- Establishing standards for the manufacturing of nutritional supplements for sports in India

Accordingly, the prime features of the Act are:

- Prohibiting athletes, athlete support personnel and other persons from engaging in doping in sport.
- Anti-doping rule violation may result in disqualification of results including forfeiture of medals, points and prizes, ineligibility to participate in a competition or event for a prescribed period, financial sanctions, etc.
- Constituting NADA – which was established as a society - into a statutory body.
- Establishing a National Board for Anti-Doping in Sports to make recommendations to the government on anti-doping regulation and compliance with international commitments on anti-doping. It will also oversee the activities of NADA and issue directions to the agency.

During the discussion on the Bill, the Sports and Youth Affairs Minister drew attention to the abysmally low level of testing facilities in the country,

“We are yet to open our eyes to the doping in our country which was earlier confined only to the senior national level but has now reached the junior, college and district levels. It is a serious concern which needs to be addressed.” – **P.T. Usha, legendary athlete and Member of Parliament** said while stressing that all competitions should be brought under NADA

In her speech, she also addressed the elephant in the room with, “There is a need to create awareness about the abuse of performance-enhancing drugs and there should be no delay in timely action and an appropriate ban against those who test positive for steroids and performance-enhancing substances”.



P.T. USHA

“India can carry out only about 6,000 tests a year at present. The proposed legislation will help increase the testing capacity significantly”. He added that for holding any major international championship, the number of tests required could be as high as 10,000 a month.

Other members observed that the drugs used for doping are now easily available across the country and are sold as organic medicine. One of them asserted that, “Many times, an athlete is not even aware of the negative impacts of this drug!”

Such is the credence of the bill that it was passed unanimously by a voice vote in the Rajya Sabha!

The Rules are being framed and will be released soon.

What the Future Looks Like

The new law will ensure highest standards of integrity while participating and preparing for sports competitions, domestically and internationally. NADA now has the powers to conduct raids and nab dope offenders too. It is also bestowed with the responsibility to coordinate and collaborate with concerned authorities and stakeholders in matters relating to establishment of 'best practices' in the marketing and distribution of nutritional supplements including information regarding their analytical composition and quality assurance.”

On the other hand, the national doping watchdog is primed to

increase awareness, education and research facilities related to anti-doping in the country. It will also protect the interests of sportspersons as they will get sufficient space to put forth their versions, especially when they face anti-doping charges. Therefore, inadvertent or accidental use will no longer sound the death knell on the budding future and potential of the sporting talents of the country.

Conclusion

The newly minted Act is a step in the right direction in India's quest to become a sporting powerhouse. Along with this, it will also safeguard the interests of sportspersons while spreading awareness about the ill-effects of certain substances. ▶

DOPING

Control Mechanisms In India



India has been consistently fighting the menace of prohibited substances (read: drugs) in sports. NADA and NDTL are the premier national organisations driving the vision of achieving 'dope free' sport both on the domestic and international platforms.



INDIA DOES NOT support the use of prohibited supplements for enhancing performance in sports and has been unwaveringly committed to the cause of fighting such doping. This stance enfold the need to maintain fair play in the sporting world on the one hand and concern for the health of the sportspersons on the other.

Our country is a member of the Foundation Board of World Anti-Doping Agency (WADA) since 1999. The government also signed the Copenhagen Declaration on Anti-Doping in Sport in 2003 and became a signatory of the UNESCO's International Convention against Doping in Sport in 2007.

During COP-7 held at Paris in 2019, the State Parties agreed to contribute 1% of their respective regular budget to UNESCO towards the Fund for the Elimination of Doping in Sport. Following this, India released an enhanced contribution of twice the assessed value (\$72,124) in 2022. In the previous year, the government had contributed \$28,172 towards the Fund. UNESCO expressed appreciation for Government of India's ongoing contribution towards the Fund and its commitment to fight against doping in sport!

National Anti-Doping Agency (NADA)

NADA is mandated for dope free sports in India. Set up in 2005 as a society by the union government, this national organisation includes scientists and representatives from the Indian Olympic Association (IOA). The central agency is responsible for promoting,

coordinating and monitoring the doping control program in sports in all its forms in India. The chief objectives pertain to:

- Implementing anti-doping rules and policies which conform with WADA and its Anti-Doping Code (Code)
- Creating awareness about doping
- Cooperating with other anti-doping organisations
- Promoting anti-doping research and education

Therefore, test planning and result management remains the primary responsibility of NADA. The athlete testing is carried out by specially trained and accredited doping control personnel in accordance with the WADA Code and the International Standard for Testing. Athletes in its registered testing pool competing at the national and international level may be tested anytime, anywhere.



NADA accepted WADA's World Anti-Doping Code in March 2008 and adopted the National Anti-Doping Rules in accordance with its responsibilities under the Code. These rules govern the conditions under which a sport is played and are aimed at enforcing antidoping principles in a global and harmonised manner. They have been amended a few times and NADA's Anti-Doping Rules 2021 are in effect now.

Anti-Doping Rule Violations set forth in Article 2.1 through Article 2.11 of the Anti-Doping Rules 2021

- 2.1 Presence of a Prohibited Substance or its Metabolites or Markers in an Athlete's Sample.
- 2.2 Use or Attempted Use by an Athlete of a Prohibited Substance or a Prohibited Method.
- 2.3 Evading, Refusing or Failing to Submit to Sample Collection by an Athlete.
- 2.4 Whereabouts Failures by an Athlete.
- 2.5 Tampering or Attempted Tampering with any part of Doping Control by an Athlete or Other Person.
- 2.6 Possession of a Prohibited Substance or a Prohibited Method by an Athlete or Athlete Support Person.
- 2.7 Trafficking or Attempted Trafficking in any Prohibited Substance or Prohibited Method by an Athlete or Other Person.
- 2.8 Administration or Attempted Administration by an Athlete or Other Person to any Athlete In-Competition of any Prohibited Substance or Prohibited Method, or Administration or Attempted Administration to any Athlete Out-of-Competition of any Prohibited Substance or any Prohibited Method that is Prohibited Out-of-Competition.
- 2.9 Complicity or Attempted Complicity by an Athlete or Other Person.
- 2.10 Prohibited Association by an Athlete or Other Person.
- 2.11 Acts by an Athlete or Other Person to Discourage or Retaliate Against Reporting to Authorities.



NADA conducts tests across 40 disciplines at the national level. It first develops a test distribution plan and allocates the number of samples for each sport or discipline required for effective deterrence. The plan includes both in-competition and out-of-competition testing in the form of blood/urine collection.

In-Competition Testing - This is coordinated in a manner that there is only one organisation testing at one event. The criteria for selecting athletes are predetermined, based on the regulations of the relevant International Federation or event ruling body. Athletes who will be tested are notified immediately following the competition. The collected samples are analysed for 'in-competition substances' outlined in the WADA Prohibited List.

Out-of-Competition Testing - Athletes can be tested outside the event at any time and place. International or national level athletes identified in the registered testing pool are required to provide accurate and current 'whereabouts' information. This includes details such as home address, work schedule, training venues and schedule, competition schedule and anything else which will help a Doping Control Officer (DCO) find the athlete on any given day. The information is usually required on a half-yearly basis, although NADA may specify other requirements. The athlete is responsible for giving an update in case of any change in the plans. Failure to do so in accordance with anti-doping regulations may be considered an anti-doping rule violation and may result in a sanction.

Since 2009, NADA has tested more than 40,000 athletes of which 1206 were found to have committed anti-doping rule violations under the NADA Rules.

Given the considerable expenses involved in drug testing, most of the evaluations are conducted closer to the actual competitions.

In May 2019, the Union Minister of Youth Affairs and Sports, Mr. Anurag Thakur took the rising number of doping cases into account and made it mandatory to conduct tests at state-level competitions across the country. However, to strategically lessen the load, NADA will only focus on 10 'high-risk' disciplines - including athletics, boxing, track and field and weightlifting - at the state-level meets.

BCCI - the governing body of Indian cricket - has also come under the ambit of NADA from 2019. Accordingly, all cricketers can now be tested by NADA, like other sportspersons. The agency will also have the power to take disciplinary action against any player found positive.

National Dope Testing Laboratory (NDTL)



NDTL was established as an independent entity in 2008 to manage the country's anti-doping programme by providing accurate and reliable testing services. This is the only laboratory in India responsible for sports dope testing.

Initially, it was set up as the Dope Control Centre in 1990 under the Sports Authority of India. This was upgraded in 2002 for gaining permanent accreditation from the IOC and WADA.

The activities of NDTL primarily pertain to sample analysis and research work in the field of dope analysis. It is equipped with state-of-the-art facilities for research and is engaged in conducting research on various projects.



“Over the years, NDTL has grown into a premier research institute dedicated to anti-doping measures and developing global standards. It has also enhanced analytical testing qualitatively, developed new methods/protocols, and, in the process, sustained an effective fight against doping in sports.”

Dr. P. L. Sahu
Director and Chief Executive Officer, NDTL



“ I applaud the scientists of the three institutions who have worked tirelessly to create these reference materials. These reference materials are not readily available across the world but are needed by every WADA-accredited laboratory for their anti-doping analysis. ”

Anurag Thakur
Union Minister of Youth Affairs and Sports
said will launching the RMs

NDTL managed to gain the coveted WADA Accreditation in September, 2008 which is reviewed on a yearly basis. The accreditation certificate is delivered subject to the following conditions:

- The National Accreditation Board for Calibration & Testing Laboratory (NABL) granted ISO/IEC 17025 accreditation to the original Dope Control Centre in 2003.
- Compliance with the WADA International Standards for Laboratories (ISL).
- Successful completion of all proficiency testing programmes.

Apart from NADA, NDTL also tests samples received from foreign countries. It has conducted testing of various major international events like Singapore Youth Olympic Games, 2010 (Singapore), South-East Asian Games, 2017 (Malaysia) and FIFA (U-17) World Cup 2017 (India) to name a few. In 2018, NDTL tested 7307 samples, of which 3282 were from foreign countries.

However, the WADA accreditation was unfortunately suspended in August 2019 due to non-compliances during on-site assessment of the laboratory. But following untiring efforts, NDTL managed to regain the accreditation on 23rd December, 2021 and the anti-doping testing and activities were resumed with immediate effect.

Restoration of accreditation is a boost to India's efforts to achieve the highest global standards of excellence in sport. The national laboratory has enhanced analytical testing qualitatively and developed new methods/protocols as well. The facilities are now fully geared to be at par with the peer-WADA accredited labs across the globe.

NDTL is collaborating with the National Institute of Pharmaceutical Education and Research (NIPER), Guwahati and the CSIR-Indian Institute of Integrative Medicine (IIIM), Jammu for research in Anti-Doping Science. Together, they indigenously developed 10 (ten) new and rare Reference Materials (RMs) which are the purest form of chemical required for anti-doping analysis in all WADA-accredited laboratories across the world. Launched in April 2022, these will soon be exported to other countries too.

Conclusion

There are only 29 WADA-accredited labs for dope testing in the world and NDTL is one of them. However, given the sizable population and growing number of sportspersons in the country, we need at least a couple more Dope Testing Laboratories. And as NDTL is bound by WADA regulations and cannot test/certify dietary supplements, the government should identify a separate laboratory for the same. ▶



“**Athletes are responsible for any prohibited substance, or its metabolites or markers found to be present in their samples**”



Dr. P.L. SAHU

is the Director and CEO of India's National Dope Testing Laboratory (NDTL) since June 2021. Before joining NDTL, he served at Indian Pharmacopoeia Commission (IPC), Ministry of Health & Family Welfare as Principal Scientific Officer & Head – R&D.

Dr. Sahu has a Master's degree and a Ph.D. in Chemistry. He has over 28 years of rich & varied experience in analytical research & development working on various positions in top ranking drug companies in India and abroad (including Teva API India Ltd, ABDI Ibbrahim Pharmaceutical Turkey, Jubilant, Dr. Reddy's, IPCA & Lupin Ltd.)

He is accustomed to taking up professional challenges and has consistently been contributing in Indian/foreign drug companies, focusing on the Standard setting for drugs and other drug development activities. He is a qualified Technical Assessor for ISO 17025 & 17034 at NABL and has shared his vision at numerous national & international forums.

Q What are the primary issues concerning dietary supplements and other such products available in the market? Would you advise youngsters to use them?

The Dietary Supplements are an important part of an athlete's/youngster's diet and may provide some benefits, like fast recovery after intense exercise regimens, better exercise performance, fast growth, and enriching the diet. The most commonly used categories are vitamins and minerals, proteins and amino acids, stimulants, weight loss/gain etc. However, unlike medicines, the dietary supplements are not tested for quality before releasing on the market. Further, because they contain active ingredients, they can also cause unwanted effects, such as elevated blood pressure, racing or irregular heartbeat, headache, dizziness, or digestive symptoms, if administered in high dose or taken continuously. It may also cause inadvertent doping if any unlabeled prohibited substance is present.

Q Can you explain the potentially harmful effects of nutritional supplements that are irrationally available online?

Usually, the athletes are maintaining good health by taking needed nutrients. However, correcting nutrient deficiencies or supporting the immune system represents a real challenge. It has been reported that some athletes have tested positive for doping due to use of dietary supplements that had poor labelling or contamination of the product.

The unfortunate truth about most of the supplements available online, or on drugstore/gym shelves is that they are not required to go through the same FDA testing for safety and effectiveness as prescription drugs. In fact, the labelled items are also not present or sometimes unlabeled anabolic steroids were also added to increase the performance/efficacy of the said product.

Q What are the undue costs that bodybuilders and sportspersons end up paying when they become victims due to inadvertent use of such products?

At higher dose or continuous use of any supplements may leads to harmful effect. It is always advisable to consult the physician, in addition, athletes should also be aware of anti-doping science. As per Article 2.1.1 of WADA Code, it is the athlete's personal duty to ensure that no Prohibited Substance enters in their bodies. Athletes are responsible for any prohibited substance, or its metabolites or markers found to be present in their samples. Accordingly, it is not necessary that intent, fault, negligence or knowing use on the athlete's part be demonstrated in order to establish an anti-doping rule violation under Article 2.1.

Q What would you advise athletes and the common consumers when it comes to supplements?

The only way to eliminate the risk of violation of WADA Article 2.1 following dietary supplement use, is to avoid supplements altogether. However, as dietary supplements

may be beneficial in certain situations. The supplements should only be taken after consent with sports physicians who is aware of Prohibited List/Doping or in such situations where it is really required. These supplements must be tested for absence of Prohibited Substances.

Q NDTL is playing a positive role in educating and inspiring the youth and especially the sportspersons. Can you shed some light on your interventions?

NDTL is the only WADA accredited Laboratory in the country and one of the 29 Laboratories globally. The Laboratory works to promote anti-doping research in the country under the theme of clean sports. The awareness and guidance provided by the NDTL are as following;

Arranged lectures and visits for faculties/students from various universities/institutes in the field of doping science.

Scientists of NDTL provide training/dissertation work facilities for pursuing post-graduate degree in two sessions.

Q How can the laboratory testing facilities become more accessible and known to the consumers?

As per ISL, 2021, the Laboratory shall not engage in analysing commercial material or preparations (e.g. dietary or herbal supplements), unless:

Specifically requested by an Anti-Doping Organization or a hearing body as part of a Results Management or adjudication process; or

If done as part of a legitimate anti-doping research program, as determined by WADA; or

If a request is made by an athlete, the Laboratory may conduct the analysis if agreed by the Anti-Doping Organization, which may also specify conditions that must be followed prior to or during the analysis (e.g. verification of original sealed packages, product batch number).

The Laboratory shall not provide results, documentation or advice that, in any way, could be used as an endorsement of products or services.

Q FSSAI regulates supplements as food. There are rules and guidelines for their manufacture, import and sale. What more do you think is needed here?

The Food Safety and Standards Authority of India (FSSAI) has taken the initiatives for preventing unintentional doping and strengthen the anti-doping system accompanied by Amendment for insertion of new provision under 8 (3)(iii) (ba) & 8 (6) in Food Safety and Standards (Health Supplements, Nutraceuticals, Food for Special Dietary use, Food for Special Medical Purpose, Functional Food and Novel Food) Regulations, 2016 w.e.f. September 2021.

However, there is no such facility in India which ensures the quality of Dietary Supplements for absence of Prohibited Substances. The Ministry of Youth Affairs and Sports has shown keen interest to ensure the quality of the Dietary Supplements for Sportspersons and the Government of India is proposing to create a testing facility at National Forensic Science University, Ahmedabad, Gujarat.



Dr. P.L. SAHU

Director and CEO of India's
National Dope Testing Laboratory (NDTL)

Q How do you think the new Anti-Doping Act will change the use of supplements and possibility of doping?

The Act provides a statutory framework for the functioning of the National Anti-Doping Agency (NADA) and the National Dope Testing Laboratory in sports. It helps to prepare the standard guidelines and rules for strengthening the anti-doping system followed by compliance with such other obligations and commitments. The National Anti-Doping Act 2022 has provision under 16 (3) (j) & (m) for establishing best practices of nutritional supplements.

Q What are your plans for NDTL in the future?

The National Anti-Doping Bill, 2022 was passed by the Parliament in its monsoon session on 3rd August, 2022. With this, India joined a select group of countries in the world to have a law on doping control measures for enhancement of sports.

The Bill aims at boosting the statutory framework of NADA and NDTL, the Laboratory that analyses the doping samples received from within the country and neighboring countries, on the one hand, and strengthening the sporting culture in India by legalizing the Government of India's long-term commitment to promote clean sports at all levels in the country, on the other. It enshrines within its fold, apart from the basic tenets of sports, the framework put forth by the UNESCO resolution, Copenhagen Declaration, to which the Government of India is a signatory and the International Standard for Laboratories (ISLs) of WADA. Codification of these guidelines will greatly enhance the global reputation and status of India as a responsible and progressive sporting nation as only a few countries in the world have such a detailed law regulating anti-doping measures in their country.

NDTL is a key partner in this fight. It is a WADA-accredited Laboratory which is fully dedicated to testing dope samples collected from Sports person participating in National/International Sports events, in line with the WADA ISLs, Technical Documents, and guidelines, issued from time to time. The law assumes paramount importance as it is one of the only 29 such laboratories that exist worldwide, and the only such Laboratory in the country and in the South and South-East Asian region. The Laboratory is not involved in any commercial activity in so far as its laboratory testing and operations are concerned. Those countries where there are no WADA-accredited laboratories for testing of drug samples also send their samples to NDTL and NDTL gives the test reports after analysis. The statutory status accorded to the Laboratory will greatly enhance its reputation as well as reputation of the country.

The Bill will also provide for a statutory recognition for NDTL, which will bring more autonomy in administration and finance and help maintain the highest standard, fairness and approach to dope testing in the country. As India gears up to organize more and more prestigious mega international sporting events, it is the responsibility

of the NDTL to remain ever-prepared in ramping up tests of samples of sportspersons at a short notice. This requires heavy scaling up of infrastructure for collection and testing of samples, and designing newer and more advanced testing methodology in dope science. At present, the Laboratory has a testing capacity of about 6000 samples per annum. With the establishment of more Dope Testing Laboratories, the testing capacity will enhance many fold and thereby a corresponding increase is envisaged in revenue generation for the country.

The Bill encourages R&D activities in Anti-doping science, and through such measures, NDTL will carve a name for itself and the world will take cognizance of India's pioneering efforts in the elimination of doping. There is provision for establishment of more Dope Testing Laboratories in the country under the guidance and supervision of NDTL, being the Apex Dope Testing Laboratory. Thus, it is imperative for India as a rising global superpower to adhere to global sporting rules and at the same time, protect and take pride in its democratic rule-making and sovereignty. This will also align India's sporting ambition with 'Atmanirbharta' in Anti-Doping Science.

Given NDTL's present role in Asian sports, and especially South and South-East Asia regions, its working embodies India's guiding principle of 'Vasudhaiva Kutumbakam'. Thus, NDTL's broader role is to serve the entire humanity. NDTL's position as WADA-accredited Laboratory will help in undertaking dope-testing of samples of sportspersons from abroad, and also carry out testing for the international events taking place in these regions. This will not only create goodwill among nations, but also kindle a spirit of clean sports in the entire region, eventually making Asia a torchbearer of clean sports.

In addition to testing, the Laboratory conducts research in the field of Anti-Doping as new methods and techniques are being used by athletes. Moreover, we are required to be at par with the International Community in so far as eradication of doping in sports as well as promotion of drug-free sports are concerned. The research activities have been mandated by WADA and are supported by the Government of India. As on date, NDTL is actively pursuing R&D activities, in collaboration with other scientific institutions like NIPER, Guwahati and CSIR-IIIM, Jammu, in preparation and synthesis of rare Reference Materials (RMs) used in dope analysis. India has already shared some of these RMs to the WADA-accredited laboratories as a knowledge sharing.

The Laboratory has already initiated major R&D activities in the advanced and niche areas of Anti-Doping Science such as Dried Blood Spot (DBS) and Gene Dope Testing. NDTL has international collaborations with other WADA accredited Laboratories such as Cologne, Tokyo, Spain and Rome Laboratory.

In the near future, the Laboratory has also planned to set up Athlete Passport Management Unit (APMU) in India. ▶



Pyush Misra
Trustee,
Consumer Online Foundation

The Dirty Picture Behind **Dietary Supplements**

“The use of performance-enhancing drugs not only goes against the 'spirit of the sport', but can leave an indelible mark on the health of the sportsperson. The glory – if attained – will fade away sooner or later, but the side effects will linger for a lifetime!” – warns *Pyush Misra*



Everything is not fun and games when it comes to doping!



Faster and stronger: the search for a competitive edge can put lives at risk

A YOUNG SPRINTER from Rohtak recalls a time when he noticed sudden changes in his body like pimples, rashes and rapid weight gain. He warily commented, “I realised the performance-enhancing steroids I was taking were having a deleterious effect on my body!” Another athlete from Haryana admitted that doping helped her win and get a good job later. But she was unable to conceive later due to the side-effects of the drug. “What do I do of a medal now?”, is her constant lament. These are just the beginning of the umpteen woes in store.....

Sporting organisations and authorities take a firm stand against the use of drugs with strict rules and harsh penalties for those who are caught using them. Here, it is not just about maintaining a clean and fair playing field for all. The stringent regulations are also driven by the adverse health effects of performance-enhancing drugs.

The World Anti-Doping Agency; Prohibited List - a list of drugs that are prohibited in sports – is updated and published annually by the World Anti-Doping Agency (WADA). Yet, an interminable number of athletes use the prohibited steroids, erythropoietin, stimulants and human growth hormones to grow muscles, train longer and harder and deliver a superior performance. They are either unaware of or don't care about the potentially dangerous consequences of such substances.

Many of these drugs may also be prescribed for medical reasons, but can damage the health of

sportspersons when they are used in large quantities or without medical supervision. The side effects can range from anxiety, restlessness and trembling to allergies, infections and acne to high blood pressure and impotency to even heart diseases, stroke and death.

The alarming note is that these same substances are also present in the regular dietary supplements that are consumed by fitness buffs and other common people without a second thought.....

The Heavy Toll on Health

Let us take a look at some of the common prohibited substances and their potential consequences:

Anabolic Steroids – These are the most widely used substances as they help the body to pack on muscle fast and strong. Athletes find that they can train harder and recover faster! However, health issues like high blood pressure, liver problems, kidney failure and heart disease are just round the corner. Sustained use can also lead to aggression, acne and baldness. Women report more facial hair, deepened voice and altered menstrual cycle while there is an incidence of reduced sperm production, impotence and prostate cancer in men.

Stimulants – As the name goes, these medications are designed to stimulate the central nervous system which will ramp up the blood flow and energy. Athletes resort to

stimulants like amphetamines, cocaine, ecstasy and methylphenidate apart from the regular nicotine and caffeine as they considerably enhance the speed, focus and reaction time. It works like an adrenalin rush which pushes them to take risks that translate into better performance. The increased heart velocity also reduces fatigue in the body.

However, these sporting gains go hand in hand with agitation, aggression, loss of appetite, weight loss, insomnia, palpitations, hallucinations, panic attacks, hyperthermia (increased body temperature) and more. It can quickly develop into addiction as well.

Human Growth Hormones – These substances are primarily preferred to build muscles, ligaments and tendons. This will prevent them from breaking down during exercise as well as hasten post-training recovery. However, this kind of drug abuse is also likely to manifest as muscle and joint pain, osteoarthritis, hypertension, diabetes, eye problems, heart disease and even heart failure. It can cause overgrown head, hands and feet (acromegaly) too.

as a masking agent as they will flush out other drugs or conceal their presence in the urine. However, this will be accompanied by dehydration, dizziness, muscle cramps, constipation, skin rash, fever, loss of appetite, kidney problems, etc.

Beta Blockers – This is the solution to slowing down the heart rate, blood pressure and anxiety, thus steadying the hand and eliminating trembling. It is considered a God-send for those who are competing in sports like archery, shooting and golf. The impact on the health varies from reduced circulation and endurance to dizziness, drowsiness, fatigue, memory loss, impotence, asthma attacks and even heart failure.

Narcotics – These are illicit drugs like morphine and other opioids that reduce the sensation of pain and tiredness in the body. As injured sportspersons feel a false sense of cure/well-being, it can cause them to ignore a potentially serious injury until it escalates into considerable damage. The side-effects range from loss of balance and coordination, nausea, dizziness, insomnia

Risks Involved in Consuming Performance Enhancing Drugs



Liver damage



Hypertension



Aggressive behavior



Irregular heartbeat

Erythropoietin (EPO) – This is a peptide molecule that is injected into the body to increase the production of red blood cells. Also known as blood doping, this can alternatively be achieved by transfusion of own blood - blood is removed from the body and injected later. The basic premise is to increase the flow of oxygen to the muscles and is favoured by sportspersons to improve endurance. But they are blind to side effects from the thickening of the blood which can lead to blood clots, anaemia, hypertension, pulmonary embolism, convulsions, heart attack and more. In severe cases, it can even result in death.

Diuretics – As this induces excess urination and water loss in the body, it is preferred for reducing weight to meet the weight limitations. These medications also work

and depression to decreased heart rate and even coma. Not to mention that these drugs are highly addictive.

Gene Doping – This involves manipulating the cells or genes in the body by using substances that improve physical performance and efficiency in sports. This can also accelerate repairs in the body. The side effects are increased blood viscosity, abnormal vision, headaches and hypertension.

Conclusion

The fame and money that follow winning medals and breaking records by delivering superhuman performance can seem seductive. But are you ready to face the disastrous fallout on your health that is bound to follow very soon? ▶

Workout and Dietary Supplements, Energy Drinks – All Tarrred with the Same Brush



Energy drinks and supplements may give a temporary boost, but they do much more harm than good. Indeed, there are many hidden dangers that may not come to the fore immediately, but end up taking a severe toll on the health. Therefore, try to cover your nutritional bases by all means, but do not go overboard with them!



**Are Supplements Really
Harmless Health Boosters?**

The Fad of Workout Supplements

Exercising regularly is an excellent habit as staying fit is important for maintaining good health. Many people hit the gym in a bid to lose weight or become strong, to the extent that working out becomes a passion! Fitness enthusiasts keep pushing themselves to build a healthy and muscular body while bodybuilders are literally obsessed with the biceps, triceps, pecs, six-pack abs and other aspects of their physique.

At times, the zeal to build the perfect body becomes so strong that they turn to workout supplements. Indeed, every gym worth its name has its share of coaches, staff and workout 'buddies' that tout pre-workout formulas as the answer to boosting energy and performance during exercise. A desperate aspiration for overnight results and unrealistic expectations of a perfectly sculpted and rock solid physique drives scores of youngsters to opt for steroids too.

Guzzling a pre-workout drink does seem to power the lifting and straining in the gym while a protein shake after the workout may feel like the answer to repairing the body and prepping it for the next session.

These may enhance your muscle mass and strength, but do you know the havoc that is silently wreaking inside your body? What exactly are you sacrificing at the stake of increasing exercise capacity during, and restoring muscles after a workout?

Workout supplements are dubbed as the 'Silent Killer' and for good reason! Every few months the media bombards us with alarming cases of young men and women who collapse in the gym while running on the treadmill or lifting weights. Most of them succumb to the fatal heart attack even before they can get treated in a hospital.

The finger of blame swings towards a combination of supplements and steroids along with excessive workouts and wrong food intake.

The Problem – Supplements that are designed to boost workouts contain a mix of ingredients like caffeine, creatine, B vitamins, magnesium, sodium and more. These are primarily stimulants that enhance muscle strength and exercise capacity while reducing fatigue, thus allowing you to get more out of the workout. However, they can also trigger reactions like agitation, tingling in hands and feet, headaches, cramps, digestive upset, nausea, insomnia and so on.

These are the mildest of side effects. Many manufacturers even add anabolic steroids, growth hormones and other steroid-like substances to their products and promote them as fancy workout supplements, muscle enhancers, fat burners, etc. While people revel in the immediate improvement in the workout performance and recovery, they remain blissfully unaware of the potential adverse impact on their health. Damage to the liver and kidneys, heart attack and brain stroke can manifest in the long run.

Intensive workouts call for plenty of protein to rebuild and repair the muscles that were worked. However, studies on protein powders reveal that excess protein in the body can lead to significant loss of calcium through the urine, thus weakening bone health. Continued high levels of protein consumption will also increase risk of kidney stones.

Consumers are advised to especially avoid 'proprietary blends' as this is just an excuse to conceal the specific types and amounts of ingredients used in the 'secret concoction'!

The Craze for Energy Drinks

What do you do when you need a fix in the middle of the afternoon to tide through a long workday or a lift before a Saturday night party? We don't think twice before downing an energy drink and enjoy the instant boost of alertness, energy and good mood that keeps us going longer and harder!

These energy drinks are non-alcoholic beverages that claim to re-energise the body through physical stimulation, increasing endurance and reducing fatigue and tiredness. In the past couple of years, there has been a dramatic increase in the consumption of energy drinks to power our jam-packed lifestyles. More and more teenagers are also mindlessly reaching for such drinks as a quick pick-me-up to pull an all-nighter during exams or just when feeling sluggish in the day.

India's sports and energy drinks market size reached \$2.4 billion in 2021. It is expected to scale \$5 billion by 2027, with a growth rate (CAGR) of 13.27% during 2022-2027.



The Problem – The easy availability of this purported 'elixir of energy' does not mean that they are safe to drink, especially so for the growing bodies of youngsters. This is because the energy drinks are nothing but a cocktail of stimulants and energy boosters – read caffeine, sodium, sugar, guarana, taurine, carnitine – all of which are intensely harmful for the body.

The major constituent is caffeine which is present in exceptionally high quantities (350-500 mg) – many more times than a regular cup of coffee (around 80 mg)! This is what delivers the energy fix, but can also lead to dangerous side effects like dehydration, restlessness, insomnia, increased heart rate, high blood pressure and heart palpitations. The ensuing anxiety, irritability,

What happens to the body in the 24 hours after consuming an energy drink

We look at what happens to your body after drinking an energy drink, from the moment it hits your lips to the buzz to the withdrawal symptoms.

80mg of caffeine (per 250ml can)

27.5g of sugar (per 250ml can)

- 10 MINUTES**
Once you consume an energy drink it's takes around 10 minutes for the caffeine to enter your bloodstream. Your heart rate & blood pressure start to rise.
- 15-45 MINUTES**
The time your caffeine level peaks in your bloodstream. You'll feel more alert as the stimulant starts to affect you, improving not only concentration but how alert you are.
- 30-50 MINUTES**
All of the caffeine is fully absorbed, your liver also responds by absorbing more sugar into the bloodstream.
- 1 HOUR**
Your body starts to experience a sugar crash as well as the effects of the caffeine dying down, you'll start to feel tired and energy levels will start to feel low.
- 5-6 HOURS**
This is the half life of caffeine, meaning it takes 5-6 hours for your body to reduce the content of caffeine in your bloodstream by 50%. Women on birth control tablets require double the length for their body to reduce it.
- 12 HOURS**
The time that it takes most people to fully remove caffeine from their bloodstream. The speed at which this happens does depend on many factors from age to activity.
- 12-24 HOURS**
As caffeine is a drug those that regularly drink items with it in can feel withdrawal symptoms 12-24 hours after the last dose, these often include headaches, irritability and constipation
- 7-12 DAYS**
Studies have shown this to be the time frame for your body to become tolerant to your regular caffeine dosage. Meaning you'll get used to it and so won't feel the effects as much.

(Source: www.personalise.co.uk)

headache, fatigue and tremors are also associated with caffeine withdrawal!

The World Health Organization hailed energy drinks as a 'danger to public health'!

A study conducted by the Cardiovascular Research Centre at the Royal Adelaide Hospital in Australia in 2008 found that energy drinks could increase the risk of strokes and heart attacks. According to the research, even consuming one can of the caffeinated energy drink, Red Bull could cause the blood to become sticky and increasing the risk of clotting.

Things get even worse when the energy drink is mixed with alcohol which is a common trend now. It can lead to binge drinking due to the perception that one is not as drunk as he/she really is! It also manifests as risky behaviour, like drunk driving. Alcoholic energy drinks have been linked to even adolescent brain damage.

The American Academy of Pediatrics and the American Academy of Family Physicians have taken the stance that caffeine and other stimulant substances contained in energy drinks have no place in the diet of children and adolescents. The same health cautions are applicable for adults too.

A study published in the Journal of the American Heart Association states that energy drinks also impact the heart's electrical pattern, which can be dangerous or even fatal. So, when you find yourself tired or in need of a boost, instead of risking your heart and overall health, why not try a power nap instead!

The Trend of Dietary Supplements

Our body needs a host of vitamins and minerals to function properly and stay healthy. While these are naturally present in our foods, scores of people reach out to pills, tablets, capsules or liquids containing iron, calcium, magnesium, zinc and other multivitamins. Many even pop supplements containing amino acids, enzymes, probiotics, herbs and other ingredients.

As such, dietary supplements play a beneficial role by delivering essential nutrients that improve overall health and help manage specific health conditions. The active ingredients interact with receptors in the body and cause desirable physiological changes like strengthening bones, nerve cells, muscle function and the entire immune system.

Doctors routinely prescribe such supplements for chronic weakness, fatigue, muscle pain, etc., to make up for the deficiency of specific vitamins or minerals. Pregnant women, people with dietary restrictions and the aging population also require a regular intake of supplements. However, both the dosage and period will be carefully prescribed by the physician.

Around 64% of the Indian nutritional supplements market is dominated by mineral and vitamin supplements. This nutraceuticals market is projected to cross \$18 billion by 2025. It should be noted that supplements for weight loss and sexual performance are exceptionally popular in the country.

The Problem – More is not always better in the case of dietary supplements! Therefore, popping these pills just to feel energetic, prevent diseases or to protect the body is not always beneficial.

We are already bombarded with fortified food and drinks that are packed with iron, calcium, vitamin D, omega 3 and more. In case the combined dosage from our diet and supplements exceeds the body's daily minimum requirement, it can cause side effects like headache, dizziness, nausea, vomiting, diarrhoea, digestive problems, numbness, tingling and even birth defects (depending on the nutrient that is going overboard). In extreme cases, they can damage the liver, kidneys or even turn toxic!

Exceeding the 4,000 international units (IUs) daily safe upper limit for vitamin D can lead to serious heart problems - WebMD

Moreover, dietary supplements can interfere with certain drugs and alter their effectiveness, like blood thinners, statins (for cholesterol), steroids and even chemotherapy treatment.

A Better Approach

A balanced diet is the safest way to staying healthy and energetic! The best energy comes from natural energy sources! So, consider foods that are rich in protein and other essential nutrients like fruits, vegetables, milk, eggs, nuts, meat, fish, etc. This is a more holistic way of building muscles and strength. Keep in mind that you need to drink sufficient water and get a good sleep to maintain energy levels. And if you are still craving an energy fix, why not reach for your beloved cup of coffee or tea instead?



On a more serious note, in case the nutritional needs of the body cannot be met by dietary intake alone, it is crucial to fully understand both the health benefits and risks of a workout or dietary supplement before including it in the daily regimen. Only use products that are authentic and safe.

Better yet, consult a doctor or a certified nutritionist before taking any vitamins, muscle enhancers or bodybuilding supplements. This becomes exceptionally crucial if you are already on some medications. While at it, never take more than the prescribed amount of supplements thinking that it will increase the effectiveness.

Do not make the mistake of following another person's workout or dietary supplement programme. Every individual's physiological build and requirements are unique; so what works for one may not give the same benefits to another. On a similar note, do not consult or follow the advice of your gym instructor as he/she may not be qualified enough to recommend the right supplements.

And make it a point to get yourself checked immediately if you experience any side effects after starting the supplements.

Above all, do not try to beat constant exhaustion or lack of energy with an overload of pills and powders. It could be a sign of a serious illness and is best addressed by a healthcare professional!

Conclusion

Consume any supplement or energy drink with caution! Do not be blinded by the marketing claims; beware of the side effects waiting to engulf you! Last but not the least; do not let supplements become a substitute for a healthy diet! ▶

Cleaning up the Dietary Supplements Industry with FSSAI Regulations

The government is making an effort to regulate the workout, dietary and health supplements industry by way of FSSAI regulations. They pertain to licensing, registration, ingredients and more. But without testing and approvals, is this too little?



Why are supplements not regulated the same way as prescription drugs?

ALL KINDS OF dietary and health supplements are widely available and extensively used across the country for prophylactic and therapeutic purposes. The Indian supplement industry is truly flourishing with an annual growth rate of 26% - which is similar to more developed countries like Japan. With the COVID-19 pandemic fuelling the use of nutritional supplements, the market is projected to grow from \$4 billion in 2021 to \$18 billion by 2025, with a CAGR of 35%.

But this sector suffers from a major drawback – there is no proper framework for evaluation or review of the products for their composition, quality, safety, efficacy, etc.!

While regulations in the United States, United Kingdom and Europe are streamlined to a certain extent, India does not specifically regulate the supplements space. It is only regulated generally under the Food Safety and Standards Act, 2006 and comes under the purview of the Food Safety and Standards Authority of India, https://en.wikipedia.org/wiki/Food_Safety_and_Standards_Authority_of_India (FSSAI).

The FSSAI laid down some basic regulatory guidelines and norms for nutritional/health supplements (nutraceuticals), dietary supplements and other functional foods in 2015. This was followed by the Food Safety and Standards (Health



Maintaining safety and quality standards in supplements is extremely important

Supplements, Nutraceuticals, Food for Special Dietary Use, Food for Special Medical Purpose, Functional Food and Novel Food) Regulations 2016, better known as the Nutraceutical Regulations 2016. Coming into effect from 1st January, 2018,

they lay out comprehensive rules for the manufacture and sale of these foods –

- Any Food Business Operator (FBO) intending to manufacture, import or sell food supplements (can be in powder, capsule, tablet, jelly or syrup form) needs to get registered and obtain a license from the FSSAI.
- The formulation of supplements should be on sound medical principles and in compliance with the general monograph and quality requirements specified for them in the Indian Pharmacopoeia. Their benefits should be backed up by valid data.
- The manufacturing should comply with the established Good Manufacturing Practices.
- The number of nutrients added to the food supplements cannot go beyond the Recommended Daily Allowance (RDA) set by the Indian Council of Medical Research. For health supplements, the individual nutrient content cannot be less than 15% of RDA. However, if the claim is of higher nutrient content, it cannot be less than 30% of the RDA.
- Hormones, steroids and psychotropic drugs cannot be added to any of the supplements.
- The criteria for the purity of ingredients is determined and notified by the food authority from time to time. The FBOs have to intimate the purity criteria to the FSSAI, including any change when adopted.
- There are stipulations related to sourcing of ingredients, use of additives, advertising claims and limits on contaminants, toxins and residues.
- The FSSAI can suspend or restrict sale of supplements that are not suitable for their claimed nutritional purpose or may endanger human health, in accordance with the provisions of the Act.

The FSSAI Rules and Regulations, 2011 recognize the following categories of supplements as food:

- **Health supplements** – They are made of concentrated sources of one or more nutrients with established nutritional effect. They are formulated to supplement the normal diet of a person and can be taken if the diet is not enough. They can be taken by healthy individuals.
- **Nutraceuticals** – They are naturally occurring ingredients that are extracted, isolated, or purified from food or non-food sources. If taken in a measured manner, they help maintain good health. They can be taken by healthy individuals.
- **Food for Special Dietary Use (FSDU)** – They are specially formulated to satiate specific dietary requirements for specific physiological or health conditions. Physiological conditions may include sportspeople, pregnant women, ageing population, among others. Meanwhile, health conditions may include underweight and obese people, hypertension etc.
- **Food for Special Medical Purposes (FSMP)** – They are meant for people with reduced ability to digest, absorb, or metabolize regular food. They also work to supplement such people's nutritional requirements. They can be used only under medical supervision.
- **Novel foods** – They are those foods, ingredients, or methods that were not previously used for human consumption.
- **Food with added prebiotic ingredients** – They include prebiotic ingredients which are not food themselves but are beneficial as they modulate gut microbiota.
- **Food with added probiotic ingredients** – Probiotics are live microorganisms which provide certain demonstrated health benefits.
- **Speciality food containing plant or botanical ingredients** – These are foods which have a history of safe usage.

Additionally, supplements must have any of the ingredients cited in:

- Schedule I - Vitamins and minerals
- Schedule II - Essential amino acids and other nutrients
- Schedule IV - List of plants and botanical ingredients
- Schedule VI - List of ingredients as nutraceuticals
- Schedule VII - List of strains as probiotics
- Schedule VIII - List of prebiotic compounds

Schedule V relates to additives and has a number of sub-categories (VA to VF).

The labelling requirements include:

- Clearly mention 'Nutraceuticals', 'Health Supplement', 'Food For Special Dietary Use', 'Food For Special Medical Purpose', 'Probiotic Food', etc. (as the case may be) along with the common name, if applicable
- Prominently written advisory warning 'Not For Medicinal Use'
- List the content, purpose and target consumer group
- Declare the nutritional values such as energy, carbohydrates, proteins, etc
- Detail the claimed medicinal benefits, like addressing certain physiological or disease conditions. However, they cannot claim to prevent, treat or cure a human disease
- Specify the recommended usage in terms of dosage and duration to address the risk of excess consumption
- Stipulate the precautions to be taken while consuming, known side effects, contraindications and published product-drug interactions
- State that the supplement cannot be used as a substitute for a regular diet

Another December 2018 notice disallowed the use of several ingredients in nutraceutical foods that are potentially dangerous for human health. The manufacturer has to seek prior consent from the authority for their use or will be penalised accordingly.

Recently, the FSSAI drafted a new framework that revised the classification of food supplements and other compliance criteria in the nutraceutical regulations. The FSS Nutraceutical Regulations 2022 came into effect from 1st April, 2022. Food supplements are now classified into six categories of functional foods - Health Supplements, Nutraceuticals, Food for Special Dietary Use (FSDU), Food for Special Medical Purposes (FSMP), Prebiotic Foods and Probiotic Foods. It has also brought the combination of vitamins and minerals, including use of single vitamin and mineral (in dosage formats such as tablets, capsules, syrups) at levels equal to a maximum of one Recommended Dietary Allowances under the purview of the regulations.

Nutrition Supplements for Sportspersons

The most notable feature of the new regulation is that supplements for sports use have been recategorized as FSDU. Foods for Special Dietary Uses for Sportspersons (FSDUS) cover specifically processed or formulated pills,

capsules, powders, drinks, bars and gels that satisfy particular dietary requirements which may arise because of certain sports and related physical activities. They contain ingredients required to achieve specific nutritional and performance goals.

However, it is likely that such foods may be laced with prohibited substances resulting in unintentional doping. Following a Memorandum of Understanding (MoU) signed between FSSAI and NADA (National Anti-Doping Agency), they are working together to ensure availability of safe and dope-free dietary/nutritional products for sportspersons. Together, they have developed a guidance note on Foods for Special Dietary Uses for Sportspersons that is applicable to the sports fraternity (sportspersons, sports nutritionists, health professionals, and coaches), manufacturers, importers, retailers and the general public.

The guidelines require the following statements to be mentioned on the product label:

- For Sportspersons Only
- For Oral Consumption Only
- Recommended to be used under medical advice or dietetic supervision only.
- The product is not to be used by pregnant, nursing and lactating women or by infants, or children under 5 years, or elderly, except when medically advised.
- The food is not a sole source of nutrition and should be consumed in conjunction with a nutritious diet.
- The food should be used in conjunction with an appropriate physical training or exercise regime.
- Date of Expiry/Best Before' should be clearly visible on products that are sold online

This has to be accompanied by the logo of FSDU for Sportspersons.



In addition to this, it is further required that:

- Every individual pack should have a product authentication in the form of an independent marking which the end users can validate on their own.
- The packaging should be tamper-proof to maintain the authenticity of the products.
- Manufacturers must maintain complete transparency of the supply chain of the products.
- The sellers and distributors must be verified by the manufacturers.
- Periodical tests must be conducted on the products at least twice a year to ensure that they are free from any unwanted substances.
- A repository of Certificate of Analysis (COA) should be maintained as a ready reference.
- Control samples should be preserved as stored as per the FSS Regulations.

The use of prohibited substances declared by World Anti-Doping Agency (WADA) in any of the FSDUS is strictly forbidden. The manufacturers are required to check the list of prohibited substances which is published annually by WADA.

Restrictions have been placed on the advertising of FSDUS to the general public. There are guidance rules for importers and retailers as well.

"The norms directed in the guidance note have been covered extensively and they seem to address everything that was needed." - **Dr Bindu Maurya** of Association of Food Scientists & Technologists (INDIA), also a food and beverage industry veteran

Energy Drinks

The FSSAI constituted an expert group to assess the risks of energy drinks and suggest whether standards should be laid down for them. The panel concluded that there is a need to limit consumption of energy drinks by a person per day taking into account the total caffeine content from all ingredients and items in the diet. It also stated that 'energy drinks' is a misnomer as it gives the impression that the drinks give energy and should be termed as 'caffeinated drinks'.

Accordingly, the food authority mandated registration and licensing for manufacture and import of energy drinks in India. It also added new standards in the FSS Regulations, 2011 that provide:

- Energy drinks should remove the word 'energy' and label the product as a 'caffeinated beverage'.
- Non-alcoholic beverages having caffeine more than 145mg/litre to be considered as caffeinated beverages.
- Specific permissible limits for caffeine (not more than 300mg/litre), saccharin sodium, taurine, vitamins, methyl ester and neotame along with the fruit content and total soluble solids
- Details of the fruit used in the making (if any) should be mentioned on the label.
- Mention the daily consumable limit on the product label.
- Specify a statutory warning that consumption is not recommended for pregnant women and children under a certain age.
- Every caffeinated food manufacturer must appoint a food supervisor to check the safety levels of the drinks. He/she must mandatorily conduct a hazard analysis and periodic audits to confirm compliance with FSSAI standards.

Non-compliance can attract penalties and even lead to cancellation of license.

Clearly Not Enough

It is clear that food supplements have to merely comply with the FSSAI regulations and do not need an official product approval from the apex food authority. There are FSSAI approved labs for testing the supplements, but testing and sampling is not a mandatory exercise in most cases.

Indeed, the culture is based on self-compliance wherein the supplement manufacturers are required to maintain data on manufacturing, sampling, testing and claims. Such details will have to be submitted for review when called for by the food authority.



Inspiring Trust, Assuring Safe & Nutritious Food
Ministry of Health and Family Welfare, Government of India



Food for Special Dietary Use for Sportsperson (FSDU for Sportsperson)

Nutrition supplements that are designed to improve athletic performance and/or fill gaps in the diet of sportspersons are considered as FSDUS now

FSSAI is working to strengthen the regulatory checks, but the risk of unsafe or prohibited substances in supplements still looms large. Many products are still manufactured and labelled incorrectly, thus putting health and careers (of sportspersons) at risk.

Moreover, the distinction between drugs and supplements remains fuzzy. While stringent regulations apply to the former under the Drugs & Cosmetics Act, the latter enjoy considerable leeway as they are considered as foods. Many unethical companies tweak their pharmaceutical formulations to position their products as food supplements under the FSSAI, thus bypassing the rigorous regulatory approvals and other arduous norms imposed by the Drugs Controller General of India (DCGI).

Conclusion

The regulatory scenario for supplements is still relatively nascent. We need a robust governing framework for product quality and safety that will spell the end of adverse events due to overdose, misuse, adulteration and toxicity of supplements. ▶



Payal Agarwal
Editorial Consultant

Think Twice Before Buying Supplements Online

“There has been an explosion of e-commerce websites selling health supplements to the netizens. Scores of these online sellers are coming under the scanner due to the dubious veracity and safety of their products. While some may be ineffective or even harmful, there are others that can even annihilate the promising career of an innocent athlete!”

— warns Payal Agarwal



Young athletes fall for the misleading tactics and purchase perilous supplements online

WITH SO MANY people experiencing deficiencies, feeling tired, wanting to relieve stress or looking to increase their energy and alertness levels, health supplements are in demand like never before. And like all our other shopping, purchase of sports, workout and dietary supplements is also moving online.

Indeed, e-commerce portals peddling nutritional supplements are burgeoning by the day. They post attractive ads with enticing promises or promote sensationally low prices with deep discounts 'for a limited period!' Lured by the tall claims and irresistible offers, more and more unsuspecting consumers are opting to acquire their energy pills and powders off the internet. The COVID-19 pandemic has further boosted both the demand for supplements and their online sales.

But how do you know you are really getting what you think you are buying or even what it says on the bottle? What is the surety that the pills/powders contain the specified amount of nutrients? Are you sure that the product is authentic and safe; not counterfeit or expired?

The World Health Organization (WHO) has warned about potentially life-threatening fake medical products, mainly sports supplements, that have a lot of ways to be remade by fraudulent brands!

This is not to say that any and every whey protein, BCAA, folic acid or magnesium that is bought online will be fake or unsafe. However, the proliferation of unauthorised websites selling bogus supplements cannot be discounted either. This is not limited to the shady ones only; alas, unsavoury sellers have made their way into e-commerce giants like Amazon too! It is downright impossible for these established portals to prevent third party sellers from hawking sham products or even posting fake reviews.

The Crux of the Problem

All kinds of fishy and deceptive supplements are being sold online.

They could be counterfeit - designed to look like popular products from established brands. The scammers copy everything from the packaging to the branding to pass off the phony supplements as the real deal. These are usually marketed at exceptionally cheap prices which increases the sales.

Here, you may get anything from a sub-par product that will not deliver the desired results to ones which are loaded with fillers only without any active ingredients and thus will not have any effect on the body. Then there are those with unidentified ingredients – like heavy metals - that can prove to be excessively harmful.

Many websites vend expired products of reputed brands by repackaging them with new expiry dates. Grossly discounted prices are used to mask the reality – such supplements may prove to be anything from ineffective to detrimental to toxic. Similar is the case with stolen products that are



sold by fraudulent websites – the problem here is that their quality and safety comes under the cloud as the storage, handling and shipping conditions will be questionable.

In addition to these, there are scores of manufacturers who sell new products with claims of promoting muscle mass, increasing strength and improving exercise capacity. These are intentionally (or even unknowingly) contaminated with steroids, hormones, stimulants or other performance-enhancing drugs that are prohibited by WADA (World Anti-Doping Agency). This will

A study by the General Directorate of Health and Food Safety of the European Commission on 'Official Controls on Food Sales on the Internet in the EU Member States' published in 2019 details that almost 1100 websites were verified and about 740 products were found that did not meet certain regulatory requirements. Of these, 315 food supplements incorporated false or unauthorised health claims. Also, a large part of the breaches was related to labelling and some cases of internet sales were detected that incorporated dangerous substances.

enhance their effectiveness per se, but innocent athletes may find themselves embroiled in a doping scandal when they fail a random dope test.

In fact, analysis of different dietary supplements available for purchase online revealed adulteration with

unapproved or even prohibited substances in a majority of the products. With no barriers for entry into the online supplements arena, even international fraudsters are merrily making inroads into the Indian market by way of the internet. These illegal entities keep changing their digital identity, websites, names of their products and even re-register with new company names, thus making it impossible to track and prosecute them.

This is not to say that knock-off and dangerous supplements have not made their way into brick-and-mortar

One of these medicines is fake. Can you tell which?



pharmacies or supermarket shelves. However, the incidence of fraudulent products remains much higher in the online realm. It is easy to escape legal consequences in the virtual world too!

Food supplements are actually regulated to a certain extent by the FSSAI and cannot be sold, imported or distributed without a license.

Importers are responsible for ensuring that their imported products are compliant with FSSAI requirements. They have to get the products tested in FSSAI approved labs. However, most of the online retailers (especially foreign ones) circumvent the regulations and escape the net easily.

Just to get a sense of the scale of prevalence, the IACC (International

Anti-Counterfeiting Coalition) estimated that legitimate companies that manufacture original, non-counterfeit products lose approximately \$600 billion of revenue annually because of counterfeiting.

Conclusion

There is a need for strict and wholesome testing of dietary supplements, especially those that are entering the country from abroad. Till this happens, consumers have to be wary of the source of their supplements. Especially sportspersons cannot afford to get their supplements off the internet just because they are cheaper or more easily available! ▶



- Consumers are always advised to purchase their supplements from reputable brands and established outlets, preferably offline. Established products can still be bought online, but always buy directly through the manufacturer's own website. Also check whether the website has a dedicated customer support facility or not.
- When opting for e-commerce portals like Amazon, it is better to ascertain that the seller is the manufacturer itself. It is better to pass up on third-party sellers as they may not always be legitimate.
- Strictly avoid products that make passionate or extreme claims of preventing varied diseases or curing a range of ailments.
- Be wary of over-enthusiastic reviews and testimonials that fervently vouch for the efficacy of the products, quote 'clinical studies' or claim ratifications by medical specialists/celebrities. They are most likely to be fabricated.

- Do not fall for promotions that urge you to order quickly as the discount or stocks will not last. They will mostly be fraudulent.
- Try to ascertain the veracity of the website and the seller. Read the fine print about shipping, return policy and other charges and do not sign up for subscription offers right away. Try to opt for cash-on-delivery option as far as possible.
- Another red flag is free trial offers. They may claim a nominal shipping fee or just purport to use the payment information for verification purposes. However, this could be a front for cyber fraud for stealing credit card and other personal information!
- Use your common sense. If something sounds too good to be true, it probably is. Steer clear of unbelievably low or throwaway prices; the products are most likely to be worthless and a complete waste of money. Anyway, your health is more important for sure!
- When you receive the product, check the seal of the container immediately. If it is loose or of poor quality, the product is most likely to be fake. Also try scanning the barcode to see whether the URL link is authentic or not.



- Be wary of products that are sold without the license sticker listing the date of manufacture, import date, rate, etc.
- Finally, while nutrition supplements are not subject to testing or regulations like prescription medications, there are independent agencies in USA that are testing and verifying these products. Look for the USP or NSF verification seal on imported products.

FOSTERING THE RIGHT KNOWLEDGE AND ATTITUDE TOWARDS SPORTS SUPPLEMENTS

Sportspersons should be provided a healthy ecosystem that will empower them to make informed choices. This will go a long way in protecting both their rights and health while promoting fair play.

Sportspersons themselves lament that lack of awareness is leading to misuse of supplements!



INDIA RANKS AN ignominious third in WADA's 2021 global list of dope violators. With 152 cases of doping violations across disciplines, we stand marginally below Russia (167) and Italy (157). In fact, our country has been a consistent top ten offender since 2013. However, India was at the seventh position in the 2019 report which now contains not only seasoned professionals from weightlifting, swimming, discus throw, javelin throw and wrestling, but also the names of some promising juniors!

As many as five Indians failed their dope tests ahead of the recently concluded Commonwealth Games!

With a majority of athletes who are caught doping claiming unintentional use, there is a pronounced need for spreading education and awareness among the sporting community.

For Dietary and Nutritional Supplements

Sportspersons need proper guidance on food supplements so that they can make informed choices when purchasing these products. Many athletes themselves affirm that the authorities should do more to educate sportspeople.

To begin with, they should be made aware of the difference between general health supplements and those that are specially formulated for sportspersons. Going forward, they should be sensitised on how to:

- Carefully read the label and claims of the products to gauge the benefits before using them.
- Choose supplements as per their daily activity, gender, age or the specific sports goals to be achieved after getting a fair idea of the associated risks.
- Understand the required dosage, frequency and duration of use of supplements based on their individual requirements.
- Comprehend that 'having higher doses gives better results' is a grave misconception.
- Always check the Expiry Date/Best Before Date.

- Look for tamper proof /tamper evident packing.
- Use the authentication system provided by the manufacturer.
- For any query or grievance, they can contact the manufacturer on the customer grievance details provided.
- Above all, they should always consume supplements under the professional guidance of trained sports nutritionists, health professionals or coaches.

Additionally, athletes and other players must be aware of the prohibited substances as per WADA.

Sportspersons should always choose food first to ensure that their nutritional needs are met! And they should never ever take things at face value!

For Performance Enhancing Drugs

Doping is not always about inadvertent or accidental use. Doping substances are easily available in pharmacies and other local stores at cheap prices, apart from online sources. The ease of access makes it difficult for many sportspersons to resist the temptation to break the rules to accommodate the craving to win at any cost!

"Doping is rampant because a good performance is a sure-shot route to success later in life, be it a government job, admission in the best schools and colleges or a lucrative contract in so many different leagues in the country."
- **Dr PSM Chandran**, former Director, Sports Sciences, Sports Authority of India and currently president of the Indian Federation of Sports Medicine

Drug testing remains cost-prohibitive. Even with the increased capacity of NDTL and implementation of rigorous testing procedures, it is just not possible to test all sportspersons all the time. With each test costing a minimum of Rs. 20,000, there is a limit on how many tests can be done. Moreover, innovative techniques of taking drugs

and masking them are constantly evolving, which keeps sports federations and other experts one step behind the dopers.

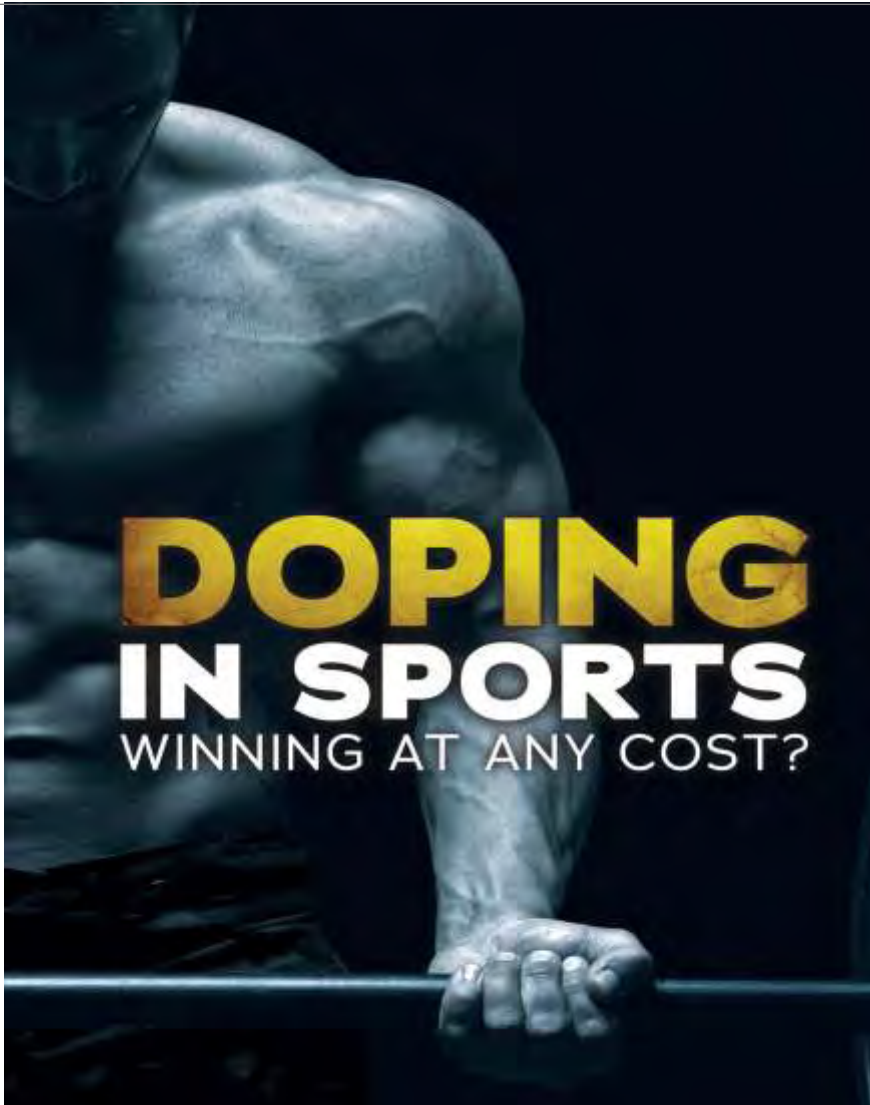
So, rather than focusing on detecting abuse, it is always better to educate the sportspersons about the potentially dangerous consequences of doping. Didactic education about the drastic fallout of not just losing their medals but also living under the stigma of being caught for the rest of their career can be dissuasive to a large extent. Additionally, they should also be imparted knowledge about the potential health risks of continued use.

Then again, sportspersons should be able to distinguish that while some sports medicines are essential for them, others will give them an unfair advantage even as the consumption harms their health.

Additionally, sports coaches, physicians and nutritionists should provide evidence-based and safe alternatives like - optimum nutrition, workout strategies and focus on training to improving performance. They should also stay abreast of the doping laws and other minutiae.

NADA is actively involved in educating the sportspersons in various training centres throughout India. It organises interactive workshops/seminars on anti-doping issues to increase awareness as well as to encourage athletes to stay

A survey conducted at a sports institute in 2022 questioned 181 male (18-35 years old) elite young athletes on their attitudes toward performance-enhancing substances and anti-doping rules. Of them, only 38.1% had attended anti-doping education sessions hosted by NADA or their federation in their institute or training camp. Overall, 67.4% of the athletes were aware about NADA or WADA, and 53.6% were aware of suspensions for anti-doping rule violations. There was a significant increase in awareness of the risks and consequences of doping reported by those who attended these sessions, compared to those who had not.



away from doping. These are conducted through sports institutions, SAI centres, state sports associations and universities/colleges. Special athlete outreach programs are organised for school level athletes.

Recently, NADA developed a technology-enabled anti-doping education and awareness generation toolkit. It is also promoting the use of internet for getting latest information and updates about prohibited substances.

“We are working on awareness generation right down to the school level about what comprises doping and related aspects.” – **Anurag Thakur**, Union Minister of Youth Affairs and Sports

NADA is also planning to make anti-doping education mandatory in all

national sports federations before they can take part in national-level tournaments.

Should Athletes be Wary of Coaches?

The role of coaches and trainers is also coming under the scanner. As majority of the aspiring sportspersons come from villages and are uneducated, they blindly follow what the coach tells or gives them.

Many unscrupulous coaches are known to offer their athletes the prohibited substances or get them in touch with elements who can supply the performance-enhancing drugs. They are looking for their own five minutes of fame, apart from the greed of recognition and fortune for their sports academies should the sportsperson emerge as an elite

player, let alone win national/international accolades.

Education and counselling will bring in awareness among the athletes even as it empowers them to make the right decisions in the interests of their career and health. This is bound to directly minimise both drug use and abuse.

Establishing the correct attitude and behaviour is also crucial here. It is imperative for the athletes to learn to balance the relentlessly competitive streak ruling sports with the values and ethics of sporting. The focus should shift back to talent and hard work instead of the driving push to do anything to gain a competitive edge. The results should celebrate excellence in mind, body and spirit.

International Standard for Education (ISE)

This is a mandatory International Standard developed by WADA as part of the World Anti-Doping Program. The overall guiding purpose is to support the preservation of the spirit of sport as outlined in the World Anti-Doping Code and to help foster a clean sport environment.

The Code highlights the need for education programs to raise awareness, provide accurate information and develop decision-making capability to prevent intentional and unintentional anti-doping rule violations. These programs should instil personal values and principles that protect the spirit of the sport.

ISE sets out the principles and minimum standards for the education programs. It is designed to support the signatories in the planning, implementation, monitoring and evaluation of effective education programs. This is accompanied by the Guidelines for Education which help them to implement and improve their education programs.

Conclusion

Why don't the authorities treat sportspersons as mature adults and seek their views and recommendations about what it will take to overcome both intentional and unintentional doping? ▶

ROBIN CARRUTHERS

— a Personal Trainer and Gym Owner - shares his views on the perils of doping for athletes from the erudite viewpoint of a fitness professional. Mr. Carruthers is a former advertising and media professional along with being a Certified Fitness Professional from the well-acclaimed National Strength and Conditioning Association.



The Dangers Of Long-Term Doping By Athletes

IN EVERY SPORT today, the goal of every single athlete is to do better than the ones that came before them. To smash or obliterate records of all kinds, at the school, college, district, city, state, national or even international level is the ultimate reward. Being deemed 'Numero Uno' is the goal for all current and budding stars looking to be crowned the 'Best of the Best'. To achieve this 'Holy Grail' of their universe, almost all athletes give years of sacrifice, blood, sweat and tears and endure hardships of the kind that we only read about, to try and turn dreams into a reality.

Most athletes are usually determined to do it the right way and treat their bodies as temples but there are many that are willing to cut corners and engage in unethical acts just to be seen as 'The Chosen One' of their sport. For these athletes, 'doping' is just a means to the end. So, what exactly is doping then and why is it firstly illegal and secondly immensely dangerous?

The term 'Doping' refers to the use of any banned substances in competitive sports like the use of Performance Enhancing Drugs (PEDs) used by athletes to improve their performance. The World Anti-Doping

Agency (WADA) has been established to protect the clean athlete and the integrity of sport. WADA leads the collaborative worldwide movement for attempting to make any sport free from 'doping'.

However, with the worry about rankings that allow athletes automatic entry in global and prestigious events, the quantum of sport and competitions being played across the world has increased considerably. This excessive pressure on the body brings about a great deal of wear and tear on the bodies of athletes resulting in various kinds and levels of injuries. When this is combined along with the fact that the time between competitions is getting shorter, athletes face the conundrum of looking to find a way to continue to boost performance, but now with much lower recovery times. This naturally puts the human body through a great deal of stress as it is pushed to the limits bringing about more danger of injury, both great and small. This sometimes forces athletes to use PEDs as a quick fix to ensure that the body doesn't break down as the body suffers through this rigorous regime to achieve personal lofty goals.

Why is doping dangerous?

Safety first! The most important reason why doping has become a big deal over the last decade or so and continues to this day, is because many of these substances can have harmful and long-lasting side effects which may include the following:

- Cardiovascular issues: irregular heart rhythm, elevated blood pressure, heart attack, sudden death
- Central Nervous System issues: insomnia, anxiousness, depression, aggressive behavior, suicide, headache, addiction with withdrawal, psychosis, tremor, dizziness, stroke
- Respiratory problems: nose bleeds, sinusitis
- Hormonal issues: infertility, gynecomastia (enlarged breasts), decreased testicular size, low sex drive, acromegaly (coarse bones in face, hands, and feet), cancer.

The secondary issue is more of a moral dilemma. These banned substances, often supplied by trusted members of the team of the athletes, are used to gain an unfair advantage. This tarnished the reward if any not to mention also significantly devalues the spirit of competition.

As stated by the World Anti-Doping Agency (WADA), the purpose of an anti-doping program is "to protect the athletes' fundamental right to participate in doping-free sport and thus promote health, fairness and equality for athletes worldwide."

What Substances Are Banned From Use?

Some drugs are banned both in and out of competition due to their performance enhancing properties, while others are only banned during competition. Another reason for banning a drug is due to their ability to mask the presence of a different banned, sometimes more powerful and effective, drug during testing.

Each organization has a different list of banned substances. A list of this information is available on various organization websites. In general, the following classes of drugs that are banned range from street drugs, stimulants, anabolic steroids, peptide hormones (i.e., human growth hormone [HGH]), alcohol and beta blockers (for archery and rifle shooting only), diuretics, beta-2 agonists, anti-estrogens, blood doping, to gene manipulation drugs.

The most dangerous and common issue in all of this is the total lack of knowledge and administration of the same. Most of this is 'broscience' where information on

PEDs and how to take them are 'instructions' that may have been followed by one athlete and passed down to be used in the same manner by many other athletes. This approach is one of the most dangerous routes to take. Not all athletes are the same or built the same and hence very often they end up with disastrous consequences and serious health issues.

Another scary situation is what I call the 6-pack syndrome! Today almost every person hitting the gym is looking for a 6-pack and may ladd here that a 6-pack is NOT an indication of good health. Given the pressure of looking good, most turn to quick fixes which almost always involves the use of PEDs and again with results that are far from ideal.

With the constant pressure to look good externally, the market for PEDs is huge with trends for the same only showing an upward growth. Worse still is the



Anabolic steroids and diuretics are popular among bodybuilders, but at what cost?

consumption of fake or spurious PEDs without the knowledge on PEDs and the impact it can have on the body. Knowledge about the combination of elements that make up PEDs is often sketchy at best. This risk to the body is immensely magnified when spurious and dangerous products are pumped into the body either orally or through intravenous injection.

In summary, the use of PEDs is not advised at all! But if you must use PEDs, then it is suggested that they be used under careful and knowledgeable guidance. But, let it be said that when it comes to enhancing performance and helping the human body recover, natural and healthy is the way to go! ▶



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Dr. Kapendra Sahu
(M. Pharm, Ph.D)

Scientist-C, National Dope Testing Laboratory

Recent Advancements in Anti-Doping

DOPING IS FORBIDDEN by athletic organizations as well as by the World Anti-Doping Agency (WADA). As performance athletics around the world grow in stature and profitability, athletes (and more notably, their trainers) are continuing to look for new ways to circumvent traditional drug testing methods.

In addition to this, in the last 2 decades, there were many cases of unintended doping because of the use of poor quality dietary supplements (DS). These supplements

Doping control statistics from the Olympic Games in Sydney and Athens in 2000 and 2004 show that 78 percent and 75.7 percent of tested athletes consumed food supplements in the three days before testing, respectively.

can also contain unlabeled substances that are on the List of Prohibited Substances as published yearly by the World Anti-Doping Agency. They are a potential source for unintentional doping violations, leading to severe sanctions for well-intentioned elite athletes.

Professional athletes are exposed to intense physical overload every day. They follow a relevant food regime and take specific dietary supplements, which is essential for the better recovery between trainings and competitions. The most commonly used categories of dietary supplements by professional athletes are vitamins and minerals, proteins and amino acids, stimulants, weight loss and others. Supplements can also benefit athletes who need to gain weight or address a known nutrient deficiency. Some common supplements function as

ergogenic aids that enhance energy production and recovery.

However, the use of “non-prohibited” dietary supplements is not always completely safe. One of the risks associated with their use is the risk of unintended doping - originating from contaminated products. The presence of undeclared compounds in the composition of DS is a serious concern.

Several studies indicate that the use of dietary supplements by elite athletes varies from 69% to 94%. The majority of DS users are not aware that the administration of such materials can be hazardous. They believe that the DS they use are approved from government agencies and that they are tested for safety and efficacy.

Subsequent studies in recent years have found that many supplements contain undeclared compounds like prohormones or anabolic androgenic steroids (AAS) such as stanozolol, methandienone, boldenone, and oxandrolone. The intake of such products will definitely lead to unintended doping. This problem is extremely serious, and its possible solutions must be considered. According to data published by the World Anti-Doping Agency, 44% of positive doping cases include anabolic steroids. This category includes endogenous AAS such as testosterone and nandrolone and many other anabolic agents such as selective androgen receptor modulators (SARMs) and clenbuterol.

The anti-doping laboratories mainly work on the following tasks:

1. To widen the range of doping substances and doping methods that can be detected.
2. To prolong the interval of time between use of a doping substance/method and the time of attainable detection.
3. To extend reproducibility and robustness of the analytical results.

It is imperative to the laboratories to work in such a manner to stay ahead of the cheating curve. Some recent advancements in anti-doping testing are as follows;

1. Long term Metabolites/Biomarkers

There are certain metabolites of steroids, which usually present over a period of months. However, these

metabolites need to be identified, which is a challenging task. Some examples classified in prohibited list under S1 category of Anabolic Steroids like metandienone, oxymetholone, and stanozolol having long term metabolites.

2. Gene Doping

Gene doping may be defined as the non-therapeutic use of cells, genes, genetic elements, or modulation of gene expression, having the capacity to enhance performance. As per some experts, gene doping could be dangerous, and perhaps even fatal.

3. Dried Blood Spot (DBS)

Dried blood spot (DBS) analysis is the cheaper and complimentary tool designed to strengthen the Anti-Doping.

4. Athlete Biological Passport (ABP)

Athlete Biological Passport (ABP), a vital anti-doping tool that monitors selected biological variables over the long period/time to reveal the effects of doping rather than attempting to detect the doping substance or method itself. It works against doping through enhanced target testing and analysis, investigations, deterrence, and as indirect evidence for use of prohibited methods or substances.

Government enabling for ensuring the Quality of DS for Sportspersons to avoid inadvertent Doping

The presence of unsafe DS in the market is a result of the liberal regulation of these products around the world. Unlike medicines, the dietary supplements are not tested for quality before releasing on the market.

A key element that is missing in the regulation of dietary supplements is the mandatory analytical control to ensure accurate quality and quantity of active substances and the absence of impurities. The intake of contaminated DS carries not only a risk of positive doping tests but also a risk to the health of the consumers.

Urgent legalization changes are needed to ensure safe and good quality products. In view of the above facts, Government of India is planning for the setup of a dietary supplement testing laboratory in India, which will minimize the risk of inadvertent doping in sportsperson. ▶



WADA President Witold Bańka said: “Dried blood spot analysis is an exciting development for anti-doping. It carries several advantages over traditional sample collection and will be an important complement to those established methods. It improves the athlete experience, it is easier to transport, easier to store, and brings possible additional benefits related to sample stability.”

Supplements

– A Blessing or a Curse for Sportspersons



India's top discus thrower and Tokyo Olympic finalist, Kamalpreet Kaur was provisionally suspended after failing a dope test. Even Asian silver medallist javelin thrower Shivpal Singh faced the same ignominy. After this, many athletes bound for the Birmingham Commonwealth Games 2022 (including sprinter Sekar Dhanalakshmi, triple jumper Aishwarya Babu, shotputter Aneesh Kumar and para powerlifter Geeta) were unceremoniously removed from the Indian contingent after returning positive tests for prohibited drugs.

More recently, Navjeet Kaur Dhillon, another leading discus thrower and 2018 Commonwealth Game bronze medallist, failed an out-of-competition dope test and has been banned for three years.

Are these cases of inadvertent doping as the athletes innocently claim or is it the driving pressure to win at any cost? As a young sprinter once lamented, "We are helpless. Everyone takes dope. If I don't I won't even win medals at the district level!" Whatever be the reason, the health of the athletes should be in the spotlight!

SPORTSPERSONS ROUTINELY LOOK to food supplements and nutritional products to derive additional benefits apart from their regular diet. Indeed, some supplements are a good source of nutrients that increase energy in the body, enhance capacity for training, promote recovery between training sessions, overcome chronic fatigue, facilitate excellent performance and more. But these sportspersons are not aware that manufacturers of dietary supplements are never called on to prove the safety, purity, or effectiveness of their products. They directly place their products on the market without having to substantiate the actual composition of these food supplements. With so much riding on what the athletes put into their bodies, is it really worth the risk?

– *Aarti Sanghi, Kanpur*

Athletes are always looking for the best ways to augment their ability to succeed in competitive sports. At the peak of their career or when national glory is just within reach, they will not care much about the potential impact on their health. While they can and should use regular supplements, they should not fall prey to certain dubious ones that may help them attain an otherwise unreachable level of performance, but at a very heavy cost of respect, career and health. Will it really be worth it in the end?

– *Abhinav Jhunjunwala, Pune*

Sportspersons are role models of the country. The youth place them on a pedestal and hope to follow in their

footsteps. When one of them falters, they deem the fallacy as correct and are more than ready to emulate the same. Do we really want to inculcate the belief in the upcoming athletes that there really is no chance of winning without doping? Why doesn't the government regulate supplements like other medications? Why aren't the testing labs more accessible to the consumers?

– *Mahesh B., Hyderabad*

The government seems to be taking measured steps for protecting the reputation and well-being of the athletes. Come to think of it, why should an athlete put more trust in pharmacology than his/her coaching? The facilities are there and you have the potential too. Can you let one pill you put in your mouth endanger the years of toil and sacrifice? Becoming aware and protecting yourself will keep you from falling victim to such foul play!

– *Sami Ahmed, Warangal*

We eye the muscular bodies of gymmers with envy. But what about the fear when we hear of people collapsing on the treadmill or cross trainer? Is it over-gymming or the supplements they are using? How should consumers know what is safe and unsafe when it comes to supplements? I see scores of stuff available online with tempting claims. But are they reliable or will they prove to be dangerous for my body? It's just a complete mess I say!

– *Vijay Mangla, Kolkatta*



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UPDATE ...



Moving a Step Ahead

Update on the August issue:

Beware Consumers - Mitigating the Plastics Tide

DRDO's Biodegradable Carry Bags – A Gamechanger for the Future!

AT A TIME when the world is clamouring for environment-friendly substitutes for single use plastics, DRDO (Defence Research Development Organisation), the research and development arm of the Ministry of Defence, has developed an innovative solution using bio-polymers.

Dr. K. Veera Brahmam, scientist who led the development of the eco-friendly solution at DRDO's Advanced Systems Laboratory (ASL), said, "Plastic pollution is the bane for not only our country but the entire world. We have been working on various polymers for missile technology, and chanced upon the idea of making something as durable as plastic which will not affect nature, by using corn starch and polybutylene-adipate-terephthalate."

After two years of dedicated research, product development, testing and standardisation, the novel product was offered to the Tirumala Tirupathi Devasthanam to use as carry bags for 'prasadam' last year.

Following this, DRDO recently transferred the groundbreaking technology 'free of cost' to 20 leading manufacturers from across the country. It even extended support during the initial setup of the production facilities. Some of them have rolled out these compostable, biodegradable and recyclable bags last month.



Transfer of technology by ASL, DRDO

Made using natural food-grade materials, the primary features of the bags are:

- High composability - will convert into manure after 90 days
- Edible – will not harm animals or the marine environment
- Resistant and durable – on par with conventional plastic bags
- Low cost technology - can be easily produced
- Above all, it does not contain any plastic!

The team of scientists are working on expanding the same technology to make water bottles, milk sachets, packaging materials and more.

Meanwhile, 45 more industries are waiting in the pipeline for approval from DRDO for the technology transfer. The agency intends to slowly facilitate the technology transfer to hundreds of firms across the country till it can entirely replace conventional plastic. International industries are also evincing keen interest in this innovative solution!

The future is definitely looking bright when it comes to curbing our plastic footprint and saving the planet. Aware consumers who are always on the lookout for sustainable and cost-effective alternatives to plastic will be able to start opting for such products very soon! ▶

100% Compostable & Biodegradable Bags

- Average degradation time is 60 days to 180 days.
- Do not generate any toxic element after degradation
- Have lesser ecological footprint than paper and plastic, which helps in climate change mitigation.
- Use less water and less energy in production in comparison with plastic and paper.
- Reduces waste management cost to municipality and reduce land usage.
- Are 100% Sustainable and eco-friendly alternative of plastic.

(Source: <http://www.pragatibiotech.com/> - one of the 20 industries selected for technology transfer by DRDO)

YOUR OPINION MATTERS

Letters to the



editor

We are truly humbled by the praise and acknowledgment that is flowing in from varied sources. Please feel free to send in your comments, views or feedback on The Aware Consumer magazine at bejonmisra@theawareconsumer.in – we will publish your opinions and implement your feedback while ensuring that your voice is heard on the right platforms.

(August issue:
**Beware Consumers -
Mitigating the Plastics Tide**)



Hailing from the plastic industry, I have been finding out and reading about recycling and biodegradable plastics from almost 2007 onwards. The articles in this magazine cover most of the

information I have googled or gathered in exhibitions and seminars over the world. They are really well researched and published. Something new I learnt was about the UV treatment.

I would like to mention that while the government is promoting biodegradable and other eco-friendly options, the regulations really need to change in this sector. Right now they are prohibitive and it is very difficult for someone to start manufacturing biodegradable bags. Approval from CIPET and CPCB itself takes about 6 months. I hope there will be some progress and relief for manufacturers in the future!

– **Nitin Sanghi**, Hyderabad •
nitinsanghi311@gmail.com



The Aware Consumer edition on Mitigating The Plastic Tide was highly informative. A lot of myths around the new universal element were busted and the

importance of plastic recycling was well highlighted through this ingenious edition. All congratulations to the team and keep up the good work.

– **Nidhi Batra**,
Associate Manager,
QCI, Delhi • nidhi.batra@qcin.org



When we say plastic, all we imagine is heaps and mountains of plastic dumps. We rarely read positive news around its management and recycling. The Aware Consumer's August edition not only attests the importance of recycling, but also throws light on the efforts by government and industry around the same. Good to read such detailed edition. Congrats.

– **Virendranath Mishra**, New Delhi
• virendranath.mishra@qcin.org

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