

Legal Ergogenic Aids?

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INTRODUCTION

In considering the use of any ergogenic aid — which means any substance or method capable of enhancing performance — the athlete and coach must consider many different factors. The most obvious of these, perhaps, is whether it really does improve performance or whether the seller's claims are just wishful thinking. The answer may not be as simple as it seems. Other factors that have to be taken into account are whether the proposed aid actually may be harmful to performance or to health, whether it contravenes the World Anti-Doping Agency (WADA) doping code or any sport-specific regulations, and whether it is against the laws of the land. The answers to these questions often are difficult to establish with any certainty.

A good example to consider is that of glycerol, which is used by some endurance athletes with the aim of promoting hyper-hydration prior to competition and thus enhancing cardiovascular and thermoregulatory function, leading in turn to improved performance. That, at least, is the theory. The evidence in the scientific literature is not entirely convincing, although there is little doubt that acute ingestion of a large bolus of glycerol together with water will lead to a temporary expansion of the body water pool. The evidence for a performance benefit is less certain. This may be due in part to the limited precision of many of the laboratory tests used to measure exercise performance and to the lack of statistical power of many of the published studies. Few studies can reliably detect performance effects — whether positive or negative — of less than a few percent, but the difference between victory and defeat in many competitions is only a small fraction of 1%. Failure to show a statistically significant effect in the laboratory does not mean there is not a meaningful effect upon the athlete's performance in competition. It also is quite possible, of course, that there is no performance benefit of preexercise glycerol ingestion.

There is some potential for negative effects of glycerol upon performance. Soon after ingestion of the amounts typically recommended, there is a large increase — in the order of 15–20 mmol·L⁻¹ — in the circulating glycerol concentration, leading to an increase in the osmolality of the plasma and the extravascular extracellular space. This has the effect of drawing water from the intracellular space into the extracellular space: the resulting decrease in intracellular volume can cause pain in some tissues, including the brain and the eyeballs. Although this effect subsides as the glycerol redistributes and is removed by metabolism, this discomfort may nevertheless result in some negative effects upon performance.

Many athletes have used glycerol without giving any thought as to whether its use may contravene the doping regulations that are designed to protect the health of athletes and to prevent unfair competition. After all, glycerol is a normal component of many foods that form part of the daily diet. The 2009 WADA Prohibited List, however, says under category S5 (Diuretics and other masking agents), "Masking agents are prohibited. They include: diuretics, probenecid, plasma expanders (e.g., intravenous administration of albumin, dextran, hydroxyethyl starch, and mannitol) and other substances with similar biological effect(s)." As so often in the world of doping, this is open to interpretation and has yet to be challenged in court, but it does seem reasonable to assume that, if the mechanism of action of glycerol is based upon an expansion of plasma volume, then it falls within the scope of the Prohibited List. Some of the examples given of substances that are prohibited by intravenous administration would be unlikely to be effective when given orally. Glycerol, however, can expand plasma volume when taken orally.

Other potential pitfalls await the athlete, in that otherwise harmless and entirely legitimate dietary supplements may contain substances that are detrimental to performance, harmful to health, or prohibited for use in sport. In 2002, two British athletes tested positive for methandrostenolone at around the same time that the International Olympic Committee (IOC)-accredited doping control laboratory in Cologne identified a "muscle building" supplement on sale in the United Kingdom as containing high doses of this same anabolic steroid without its presence being declared on the label. In September 2007, an Italian cyclist competing for the German T-Mobile team tested positive for sibutramine, a

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banned appetite suppressant. At about the same time, the Cologne laboratory, now accredited by WADA, showed that a Chinese herbal supplement claiming to promote weight loss contained substantial amounts of sibutramine, again without any warning to alert the consumer about its presence. In all three of these cases, the athletes were banned from competition. They may well have been guilty of deliberate doping, but the possibility remains that some innocent athletes have been unfairly punished.

One further consideration that many athletes either ignore or simply are unaware of is that the composition of certain medications varies in different countries. The Scottish skier Alain Baxter learned the hard way that the asthma medication that he was using perfectly legitimately in the United Kingdom was not the same as the replacement medication of the same name that he purchased in the United States at the time of the Winter Olympic Games in Salt Lake City. Even though the IOC accepted that an innocent mistake had been made, the principle of strict liability was applied: he had committed a doping offence by having a prohibited substance in his urine, and he therefore was, and is, a "drug cheat."

Some medications may be approved for use and therefore legally available in an athlete's home country. However, in other countries, the use is not approved, and possession of these medications may be a criminal offence: importing these drugs into those countries when traveling for training or competition may lead to prosecution and imprisonment. While this is unlikely, it has happened. In France, the use of creatine as a sports supplement is not permitted, although it is used widely and there is fairly compelling evidence that it is safe and can be effective. An athlete or coach who gives or sells creatine to another athlete must therefore be very careful: this is not against the WADA rules but is a breach of French law. Some Tour de France riders and their support staff have seen the inside of French jails as a result of drug raids by the police: the same may yet happen with creatine. It would be unwise for any athlete competing in France to assume that the law will not be applied in their case.

It is clear that some ergogenic aids are quite safe and can be helpful to the athlete in training or in competition. It is equally clear, however, that any athlete who goes down this road must be prepared to seek expert help to ensure they steer clear of the many potential pitfalls.

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