**INTRODUCTION**

Caffeine, a stimulant found naturally in certain leaves, beans and fruits of over 60 plants worldwide is used in sport as a potential performance aid. This paper outlines some guidance information for individuals to use so that they can be better informed about the positive and negative effects of caffeine.

***Scottish****athletics recommends that athletes do not use caffeine products, particularly young athletes and those with any health concerns.*

**HOW MUCH CAFFEINE IS SAFE TO CONSUME?**

According to the European Food Standards Agency (EFSA), single doses of caffeine up to 3mg per kilogram of body weight from all sources do not raise safety concerns for the general healthy population. This equates to around 200mg for an average adult who weighs 70kg. For many people who weigh under 70kg, the safe dose is lower than 200mg.

The following risk assessment summarises the European Food Standards Agency (EFSA) scientific opinion on caffeine.

<https://www.efsa.europa.eu/sites/default/files/corporate_publications/files/efsaexplainscaffeine150527.pdf>

It is important to emphasise the safe caffeine doses quoted above are for the general healthy population- if an athlete has an undiagnosed medical condition then these “safe” levels of caffeine are potentially unsafe.

The table below shows you some products and the average caffeine content

|  |  |
| --- | --- |
| **Product**  | **Caffeine Content**  |
| Cola (average per 330ml can)  | 40mg  |
| Instant coffee (average per mug)  | 90mg  |
| Espresso (average per 1 shot)  | 64mg  |
| Americano (average 1 mug)  | 75mg  |
| Latte (average 1 mug) | 68mg |
| Cappuccino (average 1 cup)  | 50mg |
| Tea (average 1 mug)  | 47mg |
| Gum  | 100mg  |

**It should be noted that the caffeine content of coffee can vary significantly, with instant coffee being found to be the most consistent.**

**CAFFEINE AND ATHLETIC PERFORMANCE**

Caffeine has been found to have multiple mechanisms which may be beneficial to performance including reduced perception of fatigue and increased alertness. However, before deciding whether to take caffeine for performance it is important to consider that most of the research has been carried out on elite athletes. It has been found that improvements in performance can be seen from 2-6mg/kg however, this is higher than the upper limit of the EFSA.

It is important to note that everyone responds differently to caffeine and some people may experience negative symptoms such as increased heart rate, irritability, tremor, confusion, reduced concentration and shortness of breath. Recent evidence has also been published that shows from a performance perspective some people respond positively, some people not at all and for others, caffeine can have a detrimental effect on performance even if the negative symptoms above are not experienced. Therefore, before considering caffeine it is important to weigh up whether the perceived benefits outweigh the known risks.

To understand how your body responds to caffeine it is important that it is trialled before using it at a competition. Furthermore, consuming high doses of caffeine can affect sleep quality and recovery therefore, if considering caffeine the smallest effective dose should be chosen.

**EFFECTS OF CAFFEINE ON YOUNG PEOPLE**

Most of the research into the adverse effects of caffeine on young people involve Energy Drinks as other high caffeine products such as caffeine gum are relatively new to the market and are not generally targeted at young people and children. The opinion of the Royal College of Paediatrics and Child Health is that caffeine and other stimulant substances contained in energy drinks have no nutritional benefit or place in the diet of children and adolescents.

The American Academy of Paediatrics has recommended that children should limit their intake of caffeine and abstain completely from energy drinks. If caffeine is consumed it should not exceed 100mg daily in 12 to 18 year olds. Even at 100mg negative side effects such as nausea, jitteriness and nervousness can be seen. There is also considerable evidence showing that taking an acute caffeine dose may pose a significant health risk to young athletes and those with undiagnosed heart conditions. As noted above caffeine can also have a negative impact on sleep which is essential in growth and development.

The caffeine content of energy drinks is often much higher than that found in coffee and tea. Consuming 1 can would exceed the recommended daily dose. Energy drinks often contain other stimulants that may not be on label which may be harmful to health but also carry the risk of containing banned substances. Evidence shows energy drink consumption by young people has repeatedly been associated with higher rates of risk seeking behaviours such as smoking, alcohol and other substance use, poor mental health, adverse cardiovascular effects as well as physical symptoms such as headaches, stomach aches, hyperactivity and insomnia.

<https://www.rcpch.ac.uk/sites/default/files/2018-04/final_-_rcpch_response_to_energy_drinks_inquiry.pdf>

**ADVICE AND RECOMMENDATIONS TO ATHLETES**

* Assess the health risks associated with using high caffeine products before strenuous exercise.
* Do not exceed the EFSA recommendations for safe single dose - 3mg per 1kg body mass. Current sports nutrition guidelines suggest that benefits can be seen from doses as little as 2mg/kg so if trialling it would be recommended to start at lower doses.
* Minors (U18) should not consume high caffeine products before intense physical exercise due to risk of causing unnecessary harm. There is no research to show caffeine improves performance in children or adolescents.
* Caffeine can be consumed naturally through food products however, if you choose to use a caffeine supplement only use supplements that have been batch tested through a risk minimisation scheme, for example “Informed Sport” <https://www.informed-sport.com/>.
* High caffeine products should never be used as a substitute for good nutrition and training.

**ADVICE AND RECOMMENDATIONS TO ATHLETE SUPPORT PERSONNEL AND EVENT ORGANISERS**

* Promote the positive aspects of sport.
* Ensure welfare of athletes is paramount.

Comply with the WADA Code, particularly in relation to the section on Education and Prevention of doping.

* Promote the values of Clean Sport
* Consider liabilities/ consequences if there is an incident involving an athlete overdosing on caffeine.

***It is always the athlete’s responsibility to check any products they use are within the rules and regulations of their sport. Please take time to look at the links below to ensure you have a clear understanding of the rules and regulations and for any further information.***

<https://www.ukad.org.uk/>

<https://www.wada-ama.org/>

<https://globaldro.com/Home>

[www.informed-sport.com](http://www.informed-sport.com)

**References**

Nutritics Nutrition Management Software

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Guest, N., Corey, P., Vescovi, J. and El-Sohemy, A., 2018. Caffeine, CYP1A2 Genotype, and Endurance Performance in Athletes. *Medicine and science in sports and exercise*, *50*(8), pp.1570-1578.