

AIS SPORTS SUPPLEMENT FRAMEWORK

KETONE SUPPLEMENTS GROUP B



As a group B supplement, this supplement should only be used under the close supervision of your sports dietitian

Ketones are a byproduct of fat metabolism that are generated in the liver. They can be an important body fuel during periods of low carbohydrate availability e.g. when following a low carbohydrate diet, or during prolonged endurance exercise. An elevation in ketone bodies within the blood results in a condition known as ketosis, which increases fat metabolism while also reducing use of limited carbohydrate stores. Ketone supplements are a means of increasing blood ketones without having to follow a low carb, high fat (LCHF), ketogenic diet.



Ketone supplements are available in 3 different forms:

- Salts e.g. sodium, magnesium or calcium salts of beta-hydroxy butyrate (BHB)
- Precursor to BHB (1-3-Butanediol)
- Ketone esters (can put the body into ketosis without following ketogenic diet)



Ketone salts are most likely to result in gastrointestinal side effects. What's more, they are less likely to elevate blood ketone levels

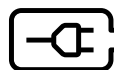
POSSIBLE BENEFITS OF SUPPLEMENTATION



INCREASED RELIANCE ON FAT AS A FUEL SOURCE (SAVING LIMITED MUSCLE CARBOHYDRATE STORES)



ENHANCED BRAIN FUNCTION (DUE TO ADDITIONAL FUEL SOURCE)



ENHANCED POST-EXERCISE RECOVERY

WHEN TO CONSIDER SUPPLEMENTATION



Longer duration endurance exercise



Periods of overload training

HOW TO USE IT

> A variety of protocols have been investigated in scientific trials with the most common involving the intake of ketone esters before, and sometimes during, endurance exercise.

> More recently, studies have considered the use of ketone esters after each training session and before bed during periods of overload training.

Total Ketone Ester dose =



350 - 1000 mg/
kg Body mass

(30 - 75 g for a 75 kg athlete)

Note: 1 bottle of ketone ester contains
25 g of the active compound



The protocols associated with testimonials in some sports are unknown.



Protocols for chronic or periodic use have not yet been established.



Combining the ketone supplements with a source of carbohydrate results in better performance and recovery.



FOOD FIRST?

> While preliminary evidence in highly trained athletes confirms LCHF diets increase rates of fat use as a fuel source, this results in a reduction in exercise economy. As such, a periodised approach to carbohydrate intake has been advocated. That is, adjusting carbohydrate intake over a training week to better match carbohydrate intake to fuel use. This also assists in achieving overall nutrient needs given the inclusion of grains and cereals, which are valuable sources of other important nutrients like B group vitamins and fibre.

CONCERNS & CONSIDERATIONS



The evidence for acute or chronic ketone supplementation on health and performance is still in its infancy.



The effects of high blood ketone levels on metabolism and other physiological outcomes is extremely complex. Different protocols and timings of use require further research.



Some studies have observed impaired performance outcomes in response to ketone supplementation. For example, an increase in blood acidity and changes to fuel use following supplementation may be counter productive to performance in some sports.



All supplements have a doping risk of some kind. Some supplements are riskier than others. Athletes should only use batch-tested supplements. The Sport Integrity Australia app provides a list of more than 400 batch-tested products. (www.sportintegrity.gov.au/what-we-do/supplements-sport).



The current research on ketone ester supplementation fails to support most of the anecdotal claims around long term use.



Ketone ester supplements are very expensive and hard to obtain due to limited commercial manufacture. Their use is controversial, although not included on the WADA prohibited list.



Several training and diet strategies are proven to favourably influence fuel use and performance. Speak to your sports dietitian for guidance on these proven strategies.



Gastrointestinal side effects like diarrhoea have been reported by athletes while using ketone salts.

While batch-tested products have the lowest risk of a product containing prohibited substances, they cannot offer you a guarantee. Before engaging in supplement use, you should refer to the specific supplement policies of your sport or institute and seek professional advice from an accredited sports dietitian (www.sportsdietitians.com.au). Athletes are reminded that they are responsible for all substances that enter their body under the 'strict liability' rules of the World Anti-Doping Code.