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Assessment of Creatine in Sports Products

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Authors' contributions

This work was carried out in collaboration among all authors. The opinion has been assessed and approved by the Panel on Food Additives, Flavourings, Processing Aids, Materials in Contact with Food and Cosmetics of the Norwegian Scientific Committee for Food Safety. All authors read and approved the final manuscript.

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Grey Literature

ABSTRACT

The Norwegian Scientific Committee for Food Safety (Vitenskapskomiteen for mattrygghet, VKM) has at the request of the Norwegian Food Safety Authority (Mattilsynet) conducted an assessment of creatine in sports products (e.g. supplements). The evaluation has been performed by an ad hoc group, and assessed by the VKM Panel on nutrition, dietetic products, novel food and allergy.

The evaluation of safety and possible risks of creatine supplementation in this opinion is based on previous reports, 23 original papers and 14 reviews from literature searches.

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Marketing and sales of sport products are increasing in the Nordic countries, with creatine supplements being one of four most common categories. In addition to be used by athletes, the use of creatine supplements seems to increase among general exercisers and young people. Creatine supplements are mainly used for their supposed effects on muscles mass and high intensity and short duration sport performances. Supplementation has been shown to result in higher concentration of creatine phosphate in the muscles, which is the limited substrate.

For athletes, it is recommended a loading dose of 10-20 g/day for 4-7 days and a maintenance dose of 2-5 g/day for weeks or months. Some athletes continue the maintenance dose for several years. It is well documented that creatine supplementation has positive effects on muscle mass combined with strength training and performance during maximal exercise. There are however large individual variation in the response, and there are responders and non-responders.

The new scientific literature, including long term studies, is in line with the EFSA (European Food Safety Authority) opinion from 2004.

VKM Panel on nutrition, dietetic products, novel food and allergy supports the EFSA conclusion that supplementation of creatine in doses below 3 g/day is unlikely to pose any risks if the purity of the creatine compound is adequate.

Scientific long-term studies with doses up to 5-10 g/day in adult athletes have shown no harmful effects, but there are no dose-response studies indicating a safe upper limit for creatine.

The potential negative effects (impaired kidney function, weight gain and gastrointestinal disturbances) which have been published in non scientific journals and anecdotal reports have not found support in controlled systematic studies on healthy subjects. It has been indicated that individuals with impaired kidney functions should refrain from creatine supplements.

Creatine-monohydrate is the most studied form of creatine supplements, and only creatine monohydrate has been included in the scientific investigations on adverse effects.

Keywords: VKM, assessment; Norwegian Scientific Committee for Food Safety; sports products.

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NOTE:

This work was carried out in collaboration between all authors. The opinion has been assessed and approved by the Panel on Nutrition, Dietetic Products, Novel Food and Allergy of the Norwegian Scientific Committee for Food Safety (VKM). All authors read and approved the final manuscript.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.