A Comprehensive Review into the Efficacy of Chromium Supplementation on Enhancement of Body Composition and Physical Performance.

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Abstract

The objective of this dissertation was to investigate the hypothesis that supplementation with chromium is capable of positively influencing changes in body composition, through increased muscle mass accretion or preservation and reduction of body fat mass in exercising and sedentary individuals. The efficacy of chromium supplementation will be evaluated through a systematic review of scientific, peer-reviewed, research papers. Chromium is an essential mineral required by the body for adequate insulin function and has been proposed as an effective weight loss agent. With the increasing prevalence of overweight and obesity in developed countries, an effective weight loss supplement which could aid exercise and dietary regimes would be valuable. The suggestion that chromium excretion is increased with physical activity and a high carbohydrate diet indicates that chromium deficiency may be an issue for athletes. The systematic search returned nineteen relevant studies which satisfied the selection criteria. Of these a total of six studies reported a significant effect of chromium supplementation either increasing or decreasing body weight, increasing or preserving lean body mass and decreasing body fat mass. Studies which were unable to find a significant effect utilised similar dosages of chromium and made attempts to assess the effects of chromium supplementation on serum chromium concentration and urinary chromium excretion. No significant effects of chromium supplementation were found on physical performance parameters. In conclusion, no significant effect of chromium supplementation on body composition in healthy, non-diabetic individuals have been found in well-designed and bias controlled studies. In terms of insulin potentiation, availability of chromium from the normal dietary intake is not the limiting factor to potentiation of insulin. Of all the studies reviewed none reported adverse effects to chromium supplementation when provided greatly in excess of recommended daily intakes. The claims that chromium supplements on the market are capable of enhancing body fat loss and muscle mass accretion are not supported by the findings of well-designed and bias controlled studies.

Declaration

This work is original and has not been submitted previously in support of a Degree, qualification or other course.

Signed:

Date:

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List of Abbreviations

Chromium Abbreviations

Cr	Chromium
CrPic	Chromium Picolinate
CrNic	Chromium Nicotinate
CrChl	Chromium Chloride

Measurement Abbreviations

kg	kilograms
g	grams
µg	micrograms
ng	nanograms
lbs	pounds
mM	Millimolar
kcal	calories

Dosage Abbreviations

$\mu g \cdot d^{-1}$	micrograms per day
$\mu g \cdot kg^{-1}$	micrograms per kilogram
$g \cdot d^{-1}$	grams per day
$ml \cdot d^{-1}$	millilitres per day

Training Abbreviations

$min \cdot d^{-1}$	minutes per day
$d \cdot wk^{-1}$	days per week

General Abbreviations

BMI	body mass index
$Kcal \cdot d^{-1}$	calories per day