



NEOLIFE

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VITAMIN C



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PEER REVIEWED STUDIES

BLOOD SUGAR BALANCE

Fruit and vegetable intake and incidence of type 2 diabetes mellitus: systematic review and meta-analysis

ABSTRACT

OBJECTIVE:

To investigate the independent effects of intake of fruit and vegetables on incidence of type 2 diabetes.

DESIGN:

Systematic review and meta-analysis.

Data Sources

Medline, Embase, CINAHL, British Nursing Index (BNI), and the Cochrane library were searched for medical subject headings and keywords on diabetes, prediabetes, fruit, and vegetables. Expert opinions were sought and reference lists of relevant articles checked.

STUDY SELECTION:

Prospective cohort studies with an independent measure of intake of fruit, vegetables, or fruit and vegetables and data on incidence of type 2 diabetes.

RESULTS:

Six studies met the inclusion criteria; four of these studies also provided separate information on the consumption of green leafy vegetables. Summary estimates showed that greater intake of green leafy vegetables was associated with a 14% (hazard ratio 0.86, 95% confidence interval 0.77 to 0.97) reduction in risk of type 2 diabetes (P=0.01). The summary estimates showed no significant benefits of increasing the consumption of vegetables, fruit, or fruit and vegetables combined.

CONCLUSION:

Increasing daily intake of green leafy vegetables could significantly reduce the risk of type 2 diabetes and should be investigated further.

Source

Carter P, et al. Fruit and vegetable intake and incidence of type 2 diabetes mellitus: systematic review and meta-analysis. *BMJ*. 2010 Aug 18;341:c4229. doi: 10.1136/bmj.c4229.

CELLULAR HEALTH

Select dietary flavonoids are associated with markers of inflammation and endothelial dysfunction in US women

ABSTRACT

Flavonoids show antiinflammatory effects in vitro and human intervention studies have suggested beneficial effects of flavonoid-rich foods on biomarkers of inflammation and endothelial function. In the present study, we assessed the relationship between flavonoid intake and biomarkers of inflammation and endothelial dysfunction in a cross-sectional study of participants from the Nurses' Health Study cohort.

Intake of 6 flavonoid subclasses (flavonols, flavones, flavanones, flavan-3-ols, anthocyanidins, and polymeric flavonoids) was assessed using a FFQ administered in 1990. Also, the main food sources of these flavonoids were examined. Blood samples were collected in 1989–1990 and plasma C-reactive protein (CRP), IL-6, IL-18, soluble tumor necrosis factor receptor-2 (sTNF-R2), soluble intercellular adhesion molecule-1, soluble vascular adhesion molecule-1 (sVCAM-1), and E-selectin were measured in 1194–1598 women. The multivariate-adjusted geometric mean of plasma IL-8 were lower for women in the highest intake quintile of flavones, flavanones, and total flavonoids compared with those in the lowest quintiles by 9% (Q1: 264 ng/L, Q5: 241 ng/L; P-trend = 0.019), 11% (Q1: 273 ng/L, Q5: 244 ng/L; P-trend = 0.011), and 8% (Q1: 276 ng/L, Q5: 55 ng/L; P-trend = 0.034), respectively. The multivariate-adjusted geometric mean for women in the highest intake quintile of flavonol compared with those in the lowest quintile was 4% lower for sVCAM-1 (Q1: 578 µg/L, Q5: 557 µg/L; P-trend = 0.012). Among flavonoid-rich foods, higher intake of grapefruit was sig-

nificantly associated with lower concentrations of CRP and sTNF-R2. In summary, higher intakes of selected flavonoid subclasses were associated with modestly lower concentrations of inflammatory biomarkers. In particular, flavonoids typically found in citrus fruits were modestly associated with lower plasma IL-18 concentrations.

Source

Landberg R, et al. Select dietary flavonoids are associated with markers of inflammation and endothelial dysfunction in US women. *Journal of nutrition*, April 2011, doi: 10.3945/jn.101.133843

COGNITIVE HEALTH

Effects of high-dose B vitamin complex with vitamin C and minerals on subjective mood and performance in healthy males

ABSTRACT

RATIONALE:

A significant proportion of the general population report supplementing their diet with one or more vitamins or minerals, with common reasons for doing so being to combat stress and fatigue and to improve mental functioning. Few studies have assessed the relationship between supplementation with vitamins/minerals and psychological functioning in healthy cohorts of non-elderly adults.

OBJECTIVES:

The present randomised, placebo-controlled, double-blind, parallel groups trial assessed the cognitive and mood effects of a high-dose B-complex vitamin and mineral supplement (Berocca®) in 215 males aged 30 to 55 years, who were in full-time employment.

METHODS:

Participants attended the laboratory prior to and on the last day of a 33-day treatment period where they completed the Profile of Mood States (POMS), Perceived Stress Scale (PSS) and General Health Questionnaire (GHQ-12). Cognitive performance and task-related modulation of

mood/fatigue were assessed with the 60 min cognitive demand battery. On the final day, participants also completed the Stroop task for 40 min whilst engaged in inclined treadmill walking and subsequent executive function was assessed.

RESULTS:

Vitamin/mineral supplementation led to significant improvements in ratings on the PSS, GHQ-12 and the 'vigour' subscale of the POMS. The vitamin/mineral group also performed better on the Serial 3s subtractions task and rated themselves as less 'mentally tired' both pre- and post-completion of the cognitive demand battery.

CONCLUSIONS

Healthy members of the general population may benefit from augmented levels of vitamins/minerals via direct dietary supplementation. Specifically, supplementation led to improved ratings of stress, mental health and vigour and improved cognitive performance during intense mental processing.

Source

Kennedy DO et al. Effects of high-dose B vitamin complex with vitamin C and minerals on subjective mood and performance in healthy males. *Psychopharmacol* 211:55-68, 2010.

Berry fruit enhances beneficial signaling in the brain

ABSTRACT

Increased lifespans have led to population aging and brought attention to healthcare concerns associated with old age. A growing body of preclinical and clinical research has identified neurological benefits associated with the consumption of berry fruits. In addition to their now well-known antioxidant effects, dietary supplementation with berry fruits also has direct effects on the brain. Intake of these fruits may help to prevent age-related neurodegeneration and resulting changes in cognitive and motor function. In cell and animal models, berry fruits mediate signaling pathways involved in inflammation and cell survival in addition

to enhancing neuroplasticity, neurotransmission, and calcium buffering, all of which lead to attenuation of age- and pathology-related deficits in behavior. Recent clinical trials have extended these antioxidant, anti-inflammatory, and cognition-sparing effects to humans. This paper reviews recent evidence for the beneficial signaling effects of berry fruits on the brain and behavior.

Source

Miller MG, Shukitt-Hale B. Berry fruit enhances beneficial signaling in the brain. *J. Agric. Food Chem.*, 2012, 60 (23): 5709–5715.

Neuroprotective effects of anthocyanins and their in vivo metabolites in SH-SY5Y cells

ABSTRACT

Recent in vivo studies have highlighted an important role for the neuroprotective actions of dietary anthocyanins. However, one consistent result of these studies is that the systemic bioavailability of anthocyanins, including cyanidin 3-O-glucopyranoside (Cy-3G), is very poor. Cy-3G has been demonstrated to be highly unstable at physiological pH, so its in vivo metabolites, such as the aglycon cyanidin (Cy) and protocatechuic acid (PA), may be responsible for both the antioxidant activity and the neuroprotective effects observed in vivo. Therefore, we investigated the protective effects of Cy-3G, Cy and PA against H₂O₂-induced oxidative stress in a human neuronal cell line (SH-SY5Y). We determined their ability to counteract reactive oxygen species (ROS) formation and to inhibit apoptosis in terms of mitochondrial functioning loss and DNA fragmentation induced by H₂O₂. We demonstrated that pretreatment of SH-SY5Y cells with Cy-3G, Cy and PA inhibits H₂O₂-induced ROS formation at different cellular levels: Cy-3G at membrane level, PA at cytosolic level and Cy at both membrane and cytosolic levels. In addition, Cy showed a higher antioxidant activity at membrane and cytosolic level than Cy-3G and PA, respectively.

Interestingly, both Cy and PA, but not Cy-3G, could inhibit H₂O₂-induced apoptotic events, such as mitochondrial functioning loss and DNA fragmentation. These results suggest that Cy and PA may be considered as neuroprotective molecules and may play an important role in brain health promotion. These in vitro findings should encourage further research in animal models of neurological diseases to explore the potential neuroprotective effects of compounds generated during in vivo metabolism of anthocyanins.

Source

Tarozzi A, et al. Neuroprotective effects of anthocyanins and their in vivo metabolites in SH-SY5Y cells. *Journal of neuroscience letters*. 2007; 424(1):36-40. doi:10.1016/j.neulet.2007.07.017

EYE HEALTH

A randomized, placebo-controlled, clinical trial of high-dose supplementation with vitamins C and E, beta carotene, and zinc for age-related macular degeneration and vision loss: AREDS report no. 8

ABSTRACT

BACKGROUND:

Observational and experimental data suggest that antioxidant and/or zinc supplements may delay progression of age-related macular degeneration (AMD) and vision loss.

OBJECTIVE:

To evaluate the effect of high-dose vitamins C and E, beta carotene, and zinc supplements on AMD progression and visual acuity.

DESIGN:

The Age-Related Eye Disease Study, an 11-center double-masked clinical trial, enrolled participants in an AMD trial if they had extensive small drusen, intermediate drusen, large drusen, noncentral geographic atrophy, or pigment abnormalities

in 1 or both eyes, or advanced AMD or vision loss due to AMD in 1 eye. At least 1 eye had best-corrected visual acuity of 20/32 or better. Participants were randomly assigned to receive daily oral tablets containing: (1) antioxidants (vitamin C, 500 mg; vitamin E, 400 IU; and beta carotene, 15 mg); (2) zinc, 80 mg, as zinc oxide and copper, 2 mg, as cupric oxide; (3) antioxidants plus zinc; or (4) placebo.

MAIN OUTCOME MEASURES:

(1) Photographic assessment of progression to or treatment for advanced AMD and (2) at least moderate visual acuity loss from baseline ($>$ or $=$ 15 letters). Primary analyses used repeated-measures logistic regression with a significance level of .01, unadjusted for covariates. Serum level measurements, medical histories, and mortality rates were used for safety monitoring.

RESULTS:

Average follow-up of the 3640 enrolled study participants, aged 55-80 years, was 6.3 years, with 2.4% lost to follow-up.

Comparison with placebo demonstrated a statistically significant odds reduction for the development of advanced AMD with antioxidants plus zinc (odds ratio [OR], 0.72; 99% confidence interval [CI], 0.52-0.98). The ORs for zinc alone and antioxidants alone are 0.75 (99% CI, 0.55-1.03) and 0.80 (99% CI, 0.59-1.09), respectively. Participants with extensive small drusen, nonextensive intermediate size drusen, or pigment abnormalities had only a 1.3% 5-year probability of progression to advanced AMD. Odds reduction estimates increased when these 1063 participants were excluded (antioxidants plus zinc: OR, 0.66; 99% CI, 0.47-0.91; zinc: OR, 0.71; 99% CI, 0.52-0.99; antioxidants: OR, 0.76; 99% CI, 0.55-1.05). Both zinc and antioxidants plus zinc significantly reduced the odds of developing advanced AMD in this higher-risk group. The only statistically significant reduction in rates of at least moderate visual acuity loss occurred in persons assigned to receive antioxidants plus zinc (OR, 0.73; 99% CI, 0.54-0.99). No statistically significant serious adverse effect was associated with any of the formulations.

CONCLUSIONS:

Persons older than 55 years should have dilated eye examinations to determine their risk of developing advanced AMD. Those with extensive intermediate size drusen, at least 1 large druse, noncentral geographic atrophy in 1 or both eyes, or advanced AMD or vision loss due to AMD in 1 eye, and without contraindications such as smoking, should consider taking a supplement of antioxidants plus zinc such as that used in this study.

Source

Age-Related Eye Disease Study Research Group. A randomized, placebo-controlled, clinical trial of high-dose supplementation with vitamins C and E, beta carotene, and zinc for age-related macular degeneration and vision loss: AREDS report no. 8. Arch Ophthalmol.

HEART HEALTH

Habitual intake of flavonoid subclasses and incident hypertension in adults

ABSTRACT

BACKGROUND:

Dietary flavonoids have beneficial effects on blood pressure in intervention settings, but there is limited information on habitual intake and risk of hypertension in population-based studies.

Objective:

We examined the association between habitual flavonoid intake and incident hypertension in a prospective study in men and women.

DESIGN:

A total of 87,242 women from the Nurses' Health Study (NHS) II, 46,672 women from the NHS I, and 23,043 men from the Health Professionals Follow-Up Study (HPFS) participated in the study. Total flavonoid and subclass intakes were calculated from semiquantitative food-frequency questionnaires collected every 4 y by using an updated and extended US Department of Agriculture database.

RESULTS:

During 14 y of follow-up, 29,018 cases of hypertension in women and 5629 cases of hypertension in men were reported. In pooled multivariate-adjusted analyses, participants in the highest quintile of anthocyanin intake (predominantly from blueberries and strawberries) had an 8% reduction in risk of hypertension [relative risk (RR): 0.92; 95% CI: 0.86, 0.98; $P < 0.03$] compared with that for participants in the lowest quintile of anthocyanin intake; the risk reduction was 12% (RR: 0.88; 95% CI: 0.84, 0.93; $P < 0.001$) in participants ≤ 60 y of age and 0.96 (0.91, 1.02) in participants > 60 y of age (P for age interaction = 0.02). Although intakes of other subclasses were not associated with hypertension, pooled analyses for individual compounds suggested a 5% (95% CI: 0.91, 0.99; $P = 0.005$) reduction in risk for the highest compared with the lowest quintiles of intake of the flavone apigenin. In participants ≤ 60 y of age, a 6% (95% CI: 0.88, 0.97; $P = 0.002$) reduction in risk was observed for the flavan-3-ol catechin when the highest and the lowest quintiles were compared.

CONCLUSIONS:

Anthocyanins and some flavone and flavan-3-ol compounds may contribute to the prevention of hypertension. These vasodilatory properties may result from specific structural similarities (including the B-ring hydroxylation and methoxylation pattern).

Source

Cassidy A, et al. Habitual intake of flavonoid subclasses and incident hypertension in adults. Am J Clin Nutr. 2011 Feb; 93 (2): 338-347

Vitamin C status and perception of effort during exercise in obese adults adhering to a calorie-reduced diet

ABSTRACT

OBJECTIVE:

Moderate energy restriction and exercise are recommended for effective weight

loss. Obese individuals oxidize less fat and report a higher perceived exertion during exercise, characteristics that may negatively influence exercise behavior.

Because vitamin C status has been linked to fatigability, we compared the effects of vitamin C supplementation on self-reported fatigue and on the respiratory exchange ratio and the Ratings of Perceived Exertion scale during moderate exercise in healthy obese adults adhering to a hypocaloric diet.

METHODS:

Twenty adults (4 men and 16 women) were stratified and randomly assigned to receive 500 mg of vitamin C (VC) or placebo (CON) daily for 4 wk while adhering to a vitamin C-controlled, calorie-restricted diet. Feelings of general fatigue as assessed by the Profile of Mood States questionnaire were recorded on a separate day from the exercise session at weeks 0 and 4. Participants walked on a treadmill at an intensity of 50% predicted maximal oxygen consumption for 60 min at weeks 0 and 4, and heart rate, respiratory exchange ratio, and Ratings of Perceived Exertion were recorded.

RESULTS:

After 4 wk, the two groups lost similar amounts of weight (≈ 4 kg), and the respiratory exchange ratio was not altered by group. Heart rate and the Ratings of Perceived Exertion during exercise were significantly decreased in the VC versus the CON group (-11 versus -3 beats/min, $P = 0.022$, and -1.3 versus +0.1 U, $P = 0.001$, respectively), and the general fatigue score was decreased 5.9 U for the VC group versus a 1.9 U increase for the CON group ($P = 0.001$).

CONCLUSION:

These data provide preliminary evidence that vitamin C status may influence fatigue, heart rate, and perceptions of exertion during moderate exercise in obese individuals.

Source

Huck CJ et al. Vitamin C status and per-

ception of effort during exercise in obese adults adhering to a calorie-reduced diet. *Nutr* [Epub June 5, 2012].

IMMUNE HEALTH

Recent advances in clinical research involving carotenoids.

ABSTRACT

Epidemiological studies show consistent decreased risk of lung cancer and certain other cancers, cataracts, age-related macular degeneration, and coronary heart disease in populations with the highest intakes of carotenoid-rich diets. Intervention studies show reductions in precancerous oral lesions, enhancement in immune parameters, and reduced incidence of cardiovascular events in individuals supplemented with β -carotene.

Source

Bendich A, et al. Recent advances in clinical research involving carotenoids. *Pure & Appl Chem*. 1994;66(5): 1017-1024.

Physicians and nurses use and recommend dietary supplements: report of a survey

ABSTRACT

BACKGROUND:

Numerous surveys show that dietary supplements are used by a large proportion of the general public, but there have been relatively few surveys on the prevalence of dietary supplement use among health professionals, including physicians and nurses. Even less information is available regarding the extent to which physicians and nurses recommend dietary supplements to their patients.

METHODS:

An online survey was administered in October 2007 to 900 physicians and 277 nurses by Ipsos Public Affairs for the Council for Responsible Nutrition (CRN), a trade association representing the dietary supplement industry. The health professionals were asked whether they used dietary supplements and their reasons for doing so, and whether they

recommend dietary supplements to their patients.

RESULTS:

The "Life...supplemented" Healthcare Professionals Impact Study (HCP Impact Study) found that 72% of physicians and 89% of nurses in this sample used dietary supplements regularly, occasionally, or seasonally. Regular use of dietary supplements was reported by 51% of physicians and 59% of nurses. The most common reason given for using dietary supplements was for overall health and wellness (40% of physicians and 48% of nurses), but more than two-thirds cited more than one reason for using the products. When asked whether they "ever recommend dietary supplements" to their patients, 79% of physicians and 82% of nurses said they did.

CONCLUSION:

Physicians and nurses are as likely as members of the general public to use dietary supplements, as shown by comparing the results of this survey with data from national health and nutrition surveys. Also, most physicians and nurses recommend supplements to their patients, whether or not the clinicians use dietary supplements themselves.

Source

Dickinson A, et al. Physicians and nurses use and recommend dietary supplements: report of a survey. *Nutr J*. 2009 Jul 1;8:29.

UPDATE: effects of antioxidant and non-antioxidant vitamin supplementation on immune function

ABSTRACT

The purpose of this manuscript is to review the impact of supplementation with vitamins E and C, carotenoids, and the B vitamins on parameters of innate and adaptive immune function as reported from clinical trials in humans. There is evidence to support causal effects of supplementation with vitamins E and C and the carotenoids singly and in combination on selected aspects of immunity, including the functional capacity of innate immune cells, lymphocyte proliferation, and the delayed-type hypersensi-

tivity (DTH) response. Controlled intervention trials of B vitamin-containing multivitamin supplements suggest beneficial effects on immune parameters and clinical outcomes in HIV-positive individuals.

Source

Webb AL, et al. Update: effects of antioxidant and non-antioxidant vitamin supplementation on immune function. *Nutr Rev*. 2007 May;65(5):181-217.

SKIN HEALTH

UVB photoprotection with antioxidants: effects of oral therapy with d-alpha-tocopherol and ascorbic acid on the minimal erythema dose

ABSTRACT

Ultraviolet radiation absorption is responsible for the production of free radicals in damaged cells. This side effect may be neutralized using antioxidant substances. It has been reported that ascorbic acid and d-alpha-tocopherol scavenge reactive oxygen species. In a single-blind controlled clinical trial we studied 45 healthy volunteers divided into three groups. Group 1 received d-alpha-tocopherol 1,200 I.U. daily; Group 2 ascorbic acid 2 g daily and Group 3 ascorbic acid 2 g plus d-alpha-tocopherol 1,200 I.U. daily. Treatment was sustained for one week. Before and after treatment, the minimal erythema dose was determined in all participants. The results show that the median minimal erythema dose increased from 60 to 65 mJ/cm² in Group 1 and from 50 to 70 mJ/cm² in Group 3. No modifications were observed in Group 2. We conclude that d-alpha-tocopherol prescribed in combination with ascorbic acid produces the best photoprotective effect.

Source

Mireles-Rocha H, et al. UVB photoprotection with antioxidants: effects of oral therapy with d-alpha-tocopherol and ascorbic acid on the minimal erythema dose. *Acta Derm Venereol* 82:21-4, 2002.

Botanicals in Dermatology: An Evidence based Review

ABSTRACT

Botanical extracts and single compounds are increasingly used in cosmetics but also in over-the-counter drugs and food supplements. The focus of the present review is on controlled clinical trials with botanicals in the treatment of acne, inflammatory skin diseases, skin infections, UV-induced skin damage, skin cancer, alopecia, vitiligo, and wounds. Studies with botanical cosmetics and drugs are discussed, as well as studies with botanical food supplements. Experimental research on botanicals was considered to a limited extent when it seemed promising for clinical use in the near future. In acne therapy, Mahonia, tea tree oil, and *Saccharomyces* may have the potential to become standard treatments. Mahonia, *Hypericum*, *Glycyrrhiza* and some traditional Chinese medicines appear promising for atopic dermatitis. Some plant-derived substances like dithranol and methoxsalen (8-methoxypsoralen) [in combination with UVA] are already accepted as standard treatments in psoriasis; Mahonia and *Capsicum* (capsaicin) are the next candidates suggested by present evidence. Oral administration and topical application of antioxidant plant extracts (green and black tea, carotenoids, coffee, and many flavonoids from fruits and vegetables) can protect skin from UV-induced erythema, early aging, and irradiation-induced cancer. Hair loss and vitiligo are also traditional fields of application for botanicals. According to the number and quality of clinical trials with botanicals, the best evidence exists for the treatment of inflammatory skin diseases, i.e. atopic dermatitis and psoriasis. However, many more controlled clinical studies are needed to determine the efficacy and risks of plant-derived products in dermatology. Safety aspects, especially related to sensitization and photodermatitis, have to be taken into account. Therefore, clinicians should not only be informed of the beneficial effects but also the specific adverse effects of botanicals used for dermatologic disorders and cosmetic purposes.

Source

Reuter J et al. Botanicals in Dermatology: An Evidence based Review. *Am J Clin Dermatol* 11:247-67, 2010.

Discovering the link between nutrition and skin aging

ABSTRACT

Skin has been reported to reflect the general inner-health status and aging. Nutrition and its reflection on skin has always been an interesting topic for scientists and physicians throughout the centuries worldwide. Vitamins, carotenoids, tocopherols, flavonoids and a variety of plant extracts have been reported to possess potent anti-oxidant properties and have been widely used in the skin care industry either as topically applied agents or oral supplements in an attempt to prolong youthful skin appearance. This review will provide an overview of the current literature "linking" nutrition with skin aging.

Source

Schagen S et al. Discovering the link between nutrition and skin aging. *Review. Dermato-Endocrinol* 4:298-307, 2012.

SPORTS NUTRITION

The Role of Nutritional Supplements in the Prevention and Treatment of Resistance-Induced Skeletal Muscle Injury

ABSTRACT

The topic of exercise-induced skeletal muscle injury has received considerable attention in recent years. Likewise, strategies to minimize the injury resulting from heavy resistance exercise have been studied. Over the past 15 years, several investigations have been performed focused on the role of nutritional supplements to attenuate signs and symptoms of muscle injury. Of these, some have reported favourable results, while many others have reported

no benefit of the selected nutrient. Despite these mixed findings, recommendations for the use of nutritional supplements for the purposes of attenuating muscle injury are rampant within the popular fitness media and athletic world, largely without scientific support. Those nutrients include the antioxidant vitamin C (ascorbic acid) and vitamin E (tocopherol), N-acetyl-cysteine, flavonoids, L-carnitine, astaxanthin, beta-hydroxy-beta-methylbutyrate, creatine monohydrate, essential fatty acids, branched-chain amino acids, bromelain, proteins and carbohydrates. A discussion of all published peer-reviewed articles in reference to these nutrients and their impact on resistance exercise-induced skeletal muscle injury is presented, in addition to a brief view into the potential mechanism of action for each nutrient. Based on the current state of knowledge, the following conclusions can be made with regard to nutritional supplements and their role in attenuating signs and symptoms of skeletal muscle injury occurring as a consequence of heavy resistance exercise: (i) there appears to be a potential role for certain supplements (vitamin C, vitamin E, flavonoids, and L-carnitine); (ii) these supplements cannot effectively eliminate muscle injury, only attenuate certain signs and symptoms; (iii) it is presently unclear what the optimal dosage of these nutrients is (whether used alone or in combination); (iv) it is unclear what the optimal pretreatment period is; and (v) the effectiveness is largely specific to non-resistance trained individuals. Ultimately, because so few studies have been conducted in this area, it is difficult to recommend with confidence the use of selected nutrients for the sole purpose of minimizing signs and symptoms of resistance exercise-induced muscle injury, in particular with regard to resistance-trained individuals.

Source

Bloomer R, et al; The Role of Nutritional Supplements in the Prevention and Treatment of Resistance-Induced Skeletal Muscle Injury. Sports Medicine, 2007.