



# Approccio Nutraceutico nello Sport Congresso Nazionale SINUT Bologna 27 Maggio 2016

# FABRIZIO ANGELINI

[www.fabrizioangelini.it](http://www.fabrizioangelini.it)



1<sup>st</sup> Sport Nutrition International Conference - Memorial Prof. Fulvio Marzatico

**BOLOGNA**  
26-27 NOVEMBER 2016

SINSeB

# SPORT NUTRITION

FROM SCIENCE TO PRACTICE

**S**ports Nutrition is a subject of great interest for everyone who works with athletes of all levels, from simple amateur to professional, but unfortunately in the area there are many differing opinions often not based on scientific data. Our association founders, including the late Prof. Fulvio Marzatico to whose memory is dedicated the event, for years had promoted a "culture" of the integration of nutrition and free from dogmas and based on scientific evidence. From this experience Sports Nutrition: From science to practice, was born and we hope that this event could be a valuable opportunity to a scientific update as well as an opportunity to discuss with some of the best sport nutrition experts in the world.

## 6 SESSIONS:

*Update in Sport Nutrition*  
*Body Composition in Sport*  
*Endocrinology and Sport Nutrition*  
*Supplements and Nutraceuticals in Sport*  
*Food Allergy, Intolerances and Sensitivity in Sport*  
*Genetics and Nutrigenomics in Sport*



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Dott. Carmine Orlandi

Dott. Nicola Sponsiello

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# Sport Nutrition Target

- **Maximize Energy**
- **Lose Body Fat**
- **Gain Lean Mass**
- **Enhance Recovery**
- **Modulation of Inflammation**



***Performance Nutrition is completely different than  
Clinical Nutrition  
It is all about fueling the body and recovering the  
body.***

# Nutrition



# Supplements



Category	Muscle Building Supplements	Weight Loss Supplements	Performance Enhancement
Apparently effective and generally safe	Weight gain powders Creatine Protein EAA	Low-calorie foods, MRPs, and RTDs Ephedra, caffeine, and salicin-containing thermogenic supplements taken at recommended doses in appropriate populations (ephedra banned by FDA)	Water and sports drinks Carbohydrate Creatine Sodium phosphate Sodium bicarbonate Caffeine B-alanine
Possibly effective	HMB (untrained individuals initiating training) BCAA	High-fiber diets Calcium Green tea extract Conjugated Linoleic Acids	Post-exercise carbohydrate & protein
Too early to tell	α-Ketoglutarate α-Ketoisocaproate Ecdysterones Growth hormone peptides and analogs Ornithine Prohormones Tribulus terrestris Vanadyl sulfate (vanadium)	Guarana Forskolin DHEA Psychotropic Nutrients/Herbs	Medium chain triglycerides
Apparently not effective and/or dangerous	Isoflavones Sulfo-polysaccharides (myostatin inhibitors) Boron Chromium Conjugated linoleic acids Gamma oryzanol Prohormones Tribulus terrestris Vanadyl sulfate (vanadium)	Calcium Pyruvate Chitosan Chromium (non-diabetics) HCA L-Carnitine Phosphates Herbal diuretics	Glutamine Ribose Inosine

**INTEGRAZIONE RAGIONATA BASATA SU EVIDENZE SCIENTIFICHE**

Supplementi per i quali la letteratura scientifica ha dimostrato una certa efficacia e sicurezza di utilizzo.

Supplementi i cui studi iniziali hanno confermato un possibile uso in campo sportivo, ma richiedono maggiori indagini per stabilirne l'efficacia sull'allenamento e/o il recupero.

Supplementi per i quali esiste solo un interesse teorico e la mancanza di una ricerca applicata non consente ancora di approcciarne un utilizzo in campo sportivo.

Supplementi senza alcun razionale scientifico, poiché le ricerche hanno chiaramente dimostrato la loro inefficacia nel migliorare la prestazione e/o il recupero.



# URTI E SPORT DRINK



Nutrient/Strategy	Rationale	Evidence	Likely Impact
Adequate nutrient availability (e.g., micronutrients, fluid)	Adequate nutrient availability maintains immunocompetence	++++	++++
High-CHO diet	Maintained blood glucose level → lower stress hormone levels → a post-ex immune response		
CHO ingestion during exercise	Maintained blood glucose stress hormone levels → a post-ex immune response		
CHO ingestion post-exercise	Attenuating effect on some (prevents lymphocytopenia return to pre-exercise level)		
Dietary protein availability	Protein is needed for production of immune variables		
Glutamine	Glutamine hypothesis; precursor		
BCAA	Precursors of glutamine		
Creatine	Muscle trauma from heavy inflammatory markers (TNF-α) Creatine prevents muscle inflammation markers		
Cystine/theanine	Reinforced glutathione synthesis anti-oxidative response & ...		
Dietary fat intake	Low-fat: energy & micronutrient deficiency High-fat: excessive intake at cost of protein/CHO	++	++
<i>n</i> -3 PUFA	Anti-inflammatory effects of <i>n</i> -3 PUFA	-	-

## Sport Drink ≥6% Carbohydrate



# ACQUA DI COCCO SPORT DRINK NATURALE ?



BEVANDA ISOTONICA  
CHO 3-4 %

CRITICITA'

GUSTO / RAPPORTO  
QUALITA' PREZZO

RISPETTO AD UNO  
SPORT DRINK  
( + POTASSIO – SODIO)

Kalman et al. *Journal of the International Society of Sports Nutrition* 2012, **9**:1  
<http://www.jissn.com/content/9/1/1>



RESEARCH ARTICLE

Open Access

Comparison of coconut water and a carbohydrate-electrolyte sport drink on measures of hydration and physical performance in exercise-trained men

Douglas S Kalman<sup>1</sup>, Samantha Feldman<sup>1</sup>, Diane R Krieger<sup>1</sup> and Richard J Bloomer<sup>2\*</sup>

I. Ismail, R. Singh, and RG. Sirisinghe, RG, **“Rehydration With Sodium-Enriched Coconut Water After Exercise-Induced Dehydration,”** *Southeast Asian Journal of Tropical Medicine Public Health*, 38 no. 4 (2007).



# Effects of a moderate intake of beer on markers of hydration after exercise in the heat: a crossover study

David Jiménez-Pavón<sup>1,2\*</sup>, Mónica Sofía Cervantes-Borunda<sup>1</sup>, Ligia Esperanza Díaz<sup>3</sup>, Ascensión Marcos<sup>3</sup> and Manuel J. Castillo<sup>1</sup>

## Abstract

**Background:** Exercise in the heat causes important water and electrolytes losses through perspiration. Optimal rehydration is crucial to facilitate the recuperation process after exercise. The aim of our study was to examine whether a moderate beer intake as part of the rehydration has any negative effect protocol after a short but dehydrating bout of exercise in the heat.

**Methods:** Sixteen active male ( $VO_2\max$ ,  $56 \pm 4$  mL/kg/min), were included in a crossover study and performed a dehydrating exercise ( $\leq 1$  h running,  $60\%VO_2\max$ ) twice and 3 weeks apart, in a hot laboratory setting ( $35 \pm 1$  °C, humidity  $60 \pm 2\%$ ). During the two hours following the exercise bouts participants consumed either mineral water *ad-libitum* (W) or up to 660 ml regular beer followed by water *ad-libitum* (BW). Body composition, hematological and serum parameters, fluid balance and urine excretion were assessed before, after exercise and after rehydration.

**Results:** Body mass (BM) decreased (both  $\sim 2.4\%$ ) after exercise in both trials. After rehydration, BM and fat free mass significantly increased although BM did not return to baseline levels (BM,  $72.6 \pm 6.7$  to  $73.6 \pm 6.9$ ; fat free mass,  $56.9 \pm 4.7$  to  $57.5 \pm 4.5$ , no differences BW vs W). Beer intake did not adversely affect any measured parameter. Fluid balance and urine excretion values did not differ between the rehydration strategies.

**Conclusions:** After exercise and subsequent water losses, a moderate beer (regular) intake has no deleterious effects on markers of hydration in active individuals.

**Keywords:** Dehydration, Hot conditions, Running, Alcohol, Diuresis, Young men





# International society of sports nutrition position stand: caffeine and performance

Erica R Goldstein<sup>1</sup>, Tim Ziegenfuss<sup>2</sup>, Doug Kalman<sup>3</sup>, Richard Kreider<sup>4</sup>, Bill Campbell<sup>5</sup>, Colin Wilborn<sup>6</sup>, Lem Taylor<sup>6</sup>, Darryn Willoughby<sup>7</sup>, Jeff Stout<sup>8</sup>, B Sue Graves<sup>1</sup>, Robert Wildman<sup>9</sup>, John L Ivy<sup>10</sup>, Marie Spano<sup>11</sup>, Abbie E Smith<sup>8</sup>, Jose Antonio<sup>12\*</sup>

Goldstein et al. *Journal of the International Society of Sports Nutrition* 2010, **7**:5  
<http://www.issn-online.com/content/7/1/5>

## Abstract

Position Statement: The position of The Society regarding caffeine supplementation and sport performance is summarized by the following seven points: 1.) Caffeine is effective for enhancing sport performance in trained athletes when consumed in low-to-moderate dosages (~3-6 mg/kg) and overall does not result in further enhancement in performance when consumed in higher dosages ( $\geq 9$  mg/kg). 2.) Caffeine exerts a greater ergogenic effect when consumed in an anhydrous state as compared to coffee. 3.) It has been shown that caffeine can enhance vigilance during bouts of extended exhaustive exercise, as well as periods of sustained sleep deprivation. 4.) Caffeine is ergogenic for sustained maximal endurance exercise, and has been shown to be highly effective for time-trial performance. 5.) Caffeine supplementation is beneficial for high-intensity exercise, including team sports such as soccer and rugby, both of which are categorized by intermittent activity within a period of prolonged duration. 6.) The literature is equivocal when considering the effects of caffeine supplementation on strength-power performance, and additional research in this area is warranted. 7.) The scientific literature does not support caffeine-induced diuresis during exercise, or any harmful change in fluid balance that would negatively affect performance.



RESEARCH ARTICLE

Open Access

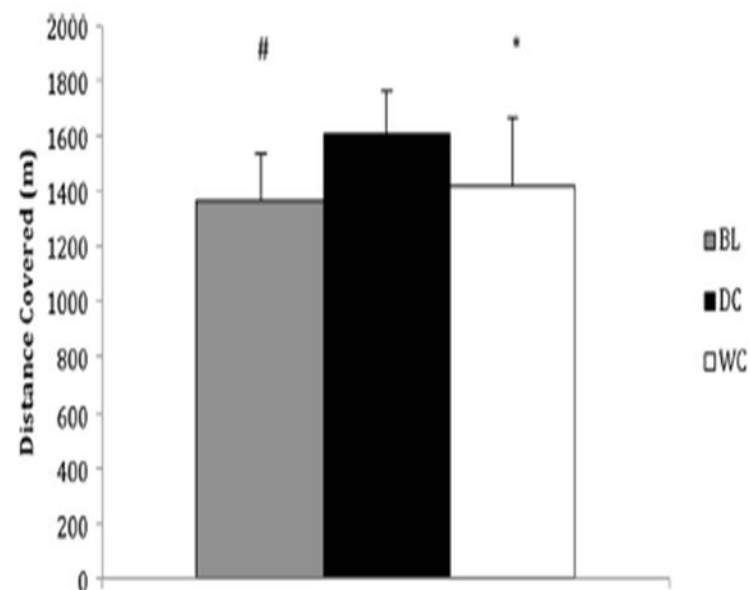
# Dark chocolate supplementation reduces the oxygen cost of moderate intensity cycling

Rishikesh Kankesh Patel\*, James Brouner and Owen Spendiff



## Conclusion

This is the first study that has investigated the effects of DC consumption on GET, oxygen demands during a twenty-minute moderate cycle,  $\dot{V}O_{2max}$  and performance of a two-minute maximal sprint. The primary outcome observed was DC consumption increased the work rate achieved at GET by 11 % compared to WC and 21 % compared to baseline ( $P < 0.05$ ). Time trial distances following DC consumption were higher compared to baseline and WC ( $P < 0.05$ ). Maximal oxygen consumption also increased following DC compared to baseline ( $P < 0.05$ ), but was not significantly different to WC. However, despite oxygen consumption and RER being consistently lower throughout the twenty minutes of moderate intensity cycling, no significant difference was observed. Consequently, it can be concluded that ingestion of DC for 14 days reduced the oxygen cost of moderate intensity exercise and may be an effective ergogenic aid for short-duration moderate intensity exercise. However, future double-blinded studies will need to confirm this effect.

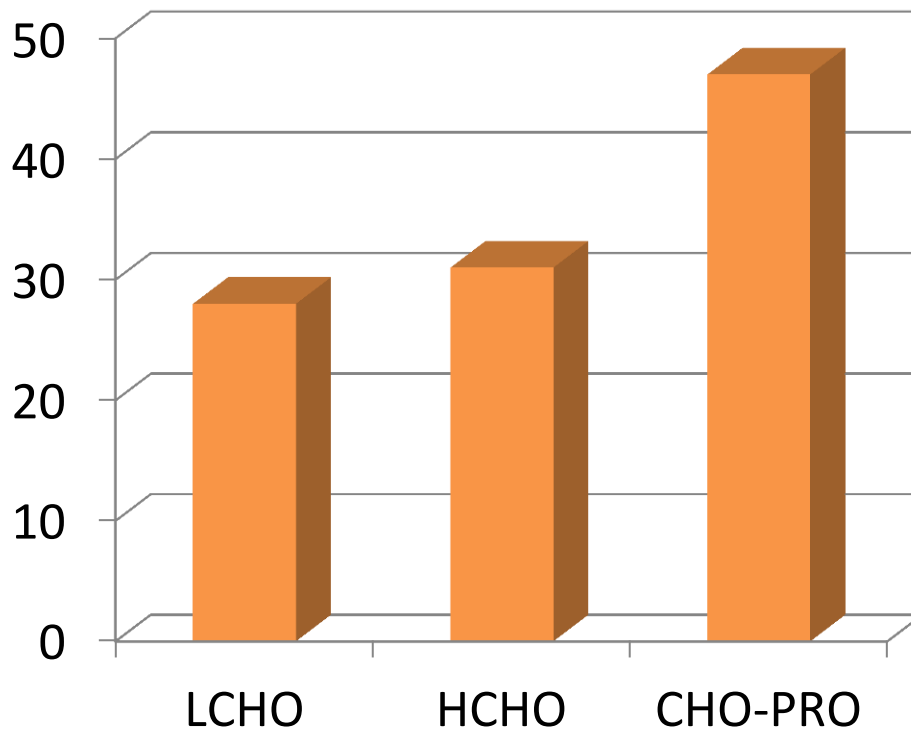


**Fig. 9** Total distanced cover (m) by participants during the two minute time trial at BL and after consumption of DC ( $n = 9$ ) and WC ( $n = 9$ ). \*Denotes significant difference between DC and BL ( $P < 0.05$ ). # Denotes a significant difference between DC and WC ( $P < 0.05$ )

# Maximizing Postexercise Muscle Glycogen Synthesis



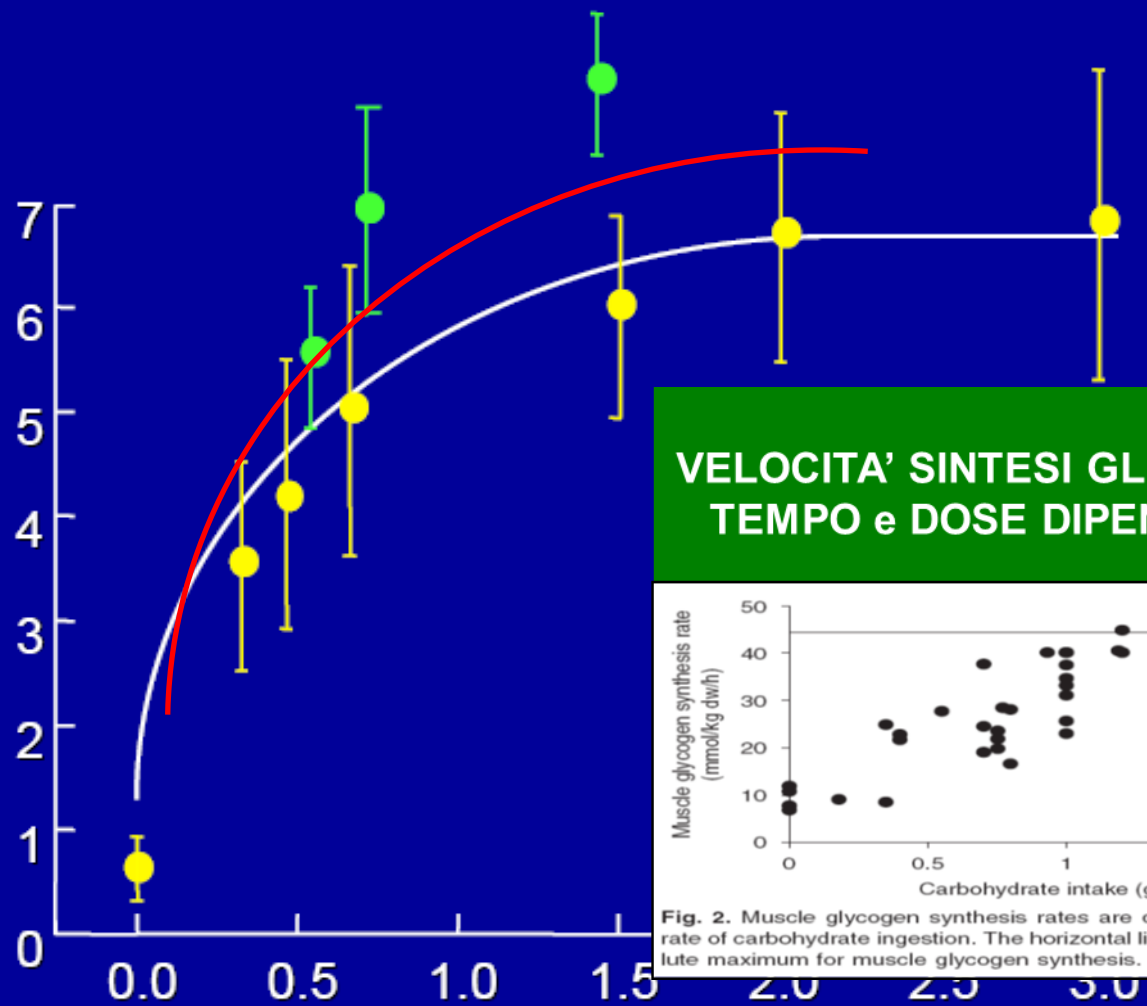
**Ivy et al., 2002  
(J Appl Physiol)**



- 7 subjects ingested CHO-PRO (80g, 28g, 6g), LCHO (80g, 6g) or HCHO (108g, 6g) 10-min and 2-hr after completing glycogen-depleting cycling exercise.
- Before exercise and 4-hr into recovery, muscle [glycogen] was determined via  $^{13}\text{C}$ -NMR spectroscopy.
- Results indicated that CHO-PRO significantly increased muscle [glycogen] relative to LCHO & HCHO.

Protein + CHO ●  
 CHO ●

**GLYCOGEN SYNTHESIS**  
 ( $\mu\text{mol/g/h}$ )



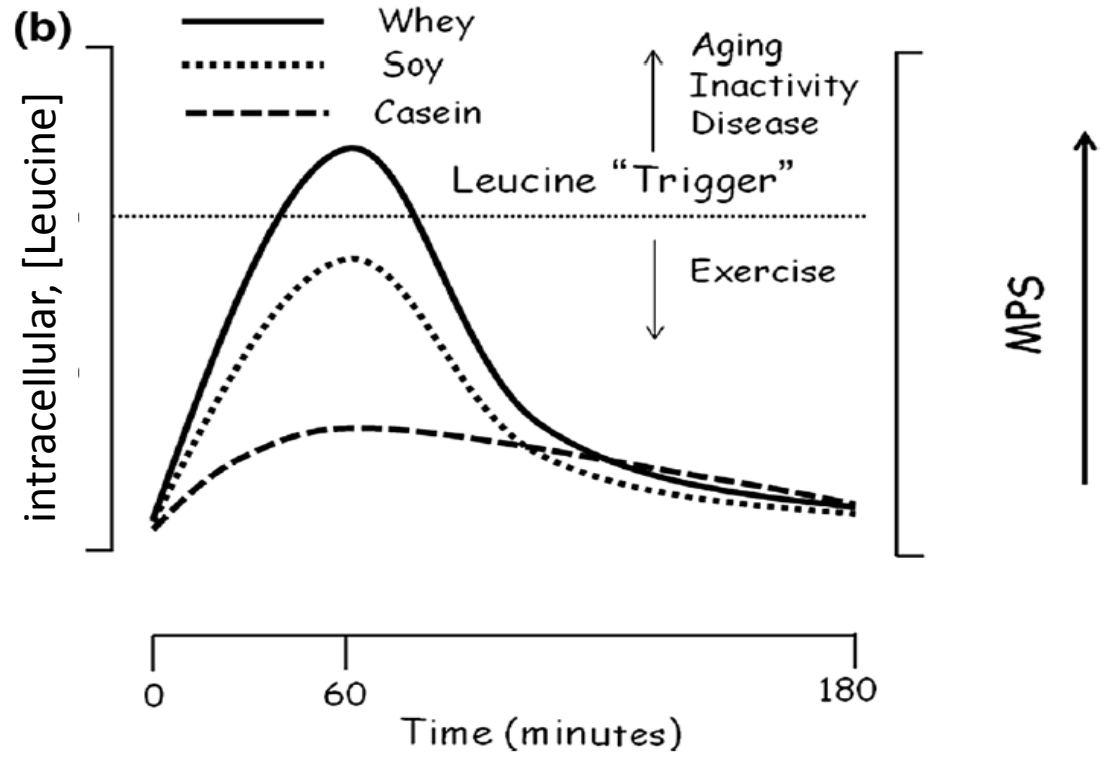
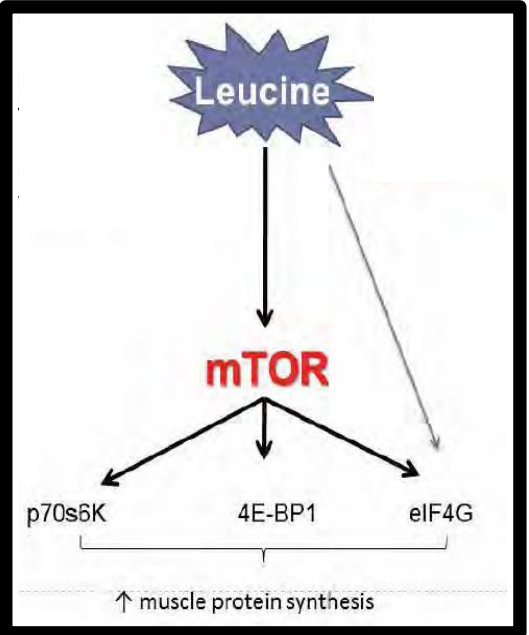
**VELOCITA' SINTESI GLICOGENO TEMPO e DOSE DIPENDENTE**

**SINERGIA**

**CHO SUPPLEMENT**  
**g/kg body wt**

**Fig. 2.** Muscle glycogen synthesis rates are depicted against the rate of carbohydrate ingestion. The horizontal line depicts the absolute maximum for muscle glycogen synthesis.

# PROTEIN QUALITY



Leucine is a key amino acid in stimulating MPS and its content in **whey protein is probably a primary reason why whey protein is so effective at stimulating MPS as opposed to isolated soy and casein proteins**

**Proteins containing a high content of leucine** that are digested rapidly are most effectively directed toward MPS;

Ingestion of foods such as milk promote a robust stimulation of MPS and highlight the fact that ‘blends’ of fast and slow proteins are still effective in stimulating MPS

Katsanos CS, Kobayashi H, Sheffield-Moore M, et al . Am J Physiol. 2006;291:E381–7.  
 Glover EI, Phillips SM, Oates BR, et al.. J Physiol. 2009;586: 6049–61  
 Sports Med (2014) 44 (Suppl 1):S71–S77

# LATTE AL CIOCCOLATO

## alimento funzionale – recovery



Ferguson-Stegall L, McCleave E, Ding Z, Doerner III PG, Liu Y, Wang B, Healy M, Kleinert M, Dessard B, Lassiter DG, Kammer L, Ivy.

**Aerobic exercise training adaptations are increased by postexercise carbohydrate-protein supplementation.** J Nutr Metab. 2011;2011:623182. Epub 2011 Jun 9

Ferguson-Stegall L, McCleave EL, Ding Z, Doerner PG 3rd, Wang B, Liao YH, Kammer L, Liu Y, Hwang J, Dessard BM, Ivy JL.

**Postexercise carbohydrate-protein supplementation improves subsequent exercise performance and intracellular signaling for protein synthesis.** J Strength Cond Res. 2011 May;25(5):1210-24.

Gilson SF, Saunders MJ, Moran CW, Moore RW, Womack CJ, Todd MK.

**Effects of chocolate milk consumption on markers of muscle recovery following soccer training: a randomized cross-over study.** J Int Soc Sports Nutr. 2010 May 18;7:19.

Karp JR, Johnston JD, Tecklenburg S, Mickleborough TD, Fly AD, Stager JM.

**Chocolate milk as a post-exercise recovery aid.** Int J Sport Nutr Exerc Metab. 2006 Feb;16(1):78-91.

Pritchett K, Bishop P, Pritchett R, Green M, Katica C.

**Acute effects of chocolate milk and a commercial recovery beverage on postexercise recovery indices and endurance cycling performance.** Appl Physiol Nutr Metab. 2009 Dec;34(6):1017-22.

Spaccarotella KJ, Andzel WD.

**Building a beverage for recovery from endurance activity: a review** - J Strength Cond Res. 2011 Nov;25(11):3198-204.



Nutrients 2014, 6, 50-62; doi:10.3390/nu6010050

### The Effects of Acute Post Exercise Consumption of Two Cocoa-Based Beverages with Varying Flavanol Content on Indices of Muscle Recovery Following Downhill Treadmill Running

Katelyn Peschek, Robert Pritchett, Ethan Bergman and Kelly Pritchett \*

Review

#### Milk: the new sports drink? A Review

Brian D Roy

Journal of the International Society of Sports Nutrition 2008, 5:15

Table 3: Composition of chocolate milk drink used by Karp et al. 2006

	Chocolate milk drink	CHO recovery drink
Kcal	187.5	187.5
kJ	787.1	787.1
Protein (g)	9.4	9.1
Fat (g)	2.6	0.7
Carbohydrate (g)	34.4	34.4
Sodium (mg)	197.9	152.8
Potassium (mg)	443.8	83.3

Adapted from Karp et al. 2006. All values are based on 250 mL of each drink.

- Efficace nel:
  - ricostituire le scorte di glicogeno;
  - migliorare la performance di un secondo esercizio dopo 8 ore di riposo;
  - incrementare sintesi proteica;
  - stimolare il processo di riparazione e ricostruzione muscolare.
- Il cioccolato rende la bevanda più appetibile ma anche il latte si è dimostrato un buon recovery drink.
- Buono ed economico.

# Cocktail di Recupero

250 ml Succo di ciliegie o Amarena



150 mL Succo di Arancia  
(60mg flavonoidi)



150 mL Succo di Mirtillo  
(725 mg flavonoidi)



# CONSUMO DI SUCCO DI CILIEGIA/AMARENA E INDICI DI RECUPERO



235 ml (2 volte die) x 8 giorni

235 ml = 60 Amarene = 600 mg composti fenolici

## Influence of tart cherry juice on indices of recovery following marathon running

G. Howatson<sup>1,4</sup>, M. P. McHugh<sup>2</sup>, J. A. Hill<sup>3</sup>, J. Brouner<sup>4</sup>, A. P. Jewell<sup>5</sup>, K. A. van Someren<sup>6</sup>, R. E. Shave<sup>7</sup>, S. A. Howatson<sup>4</sup>



### IL-6

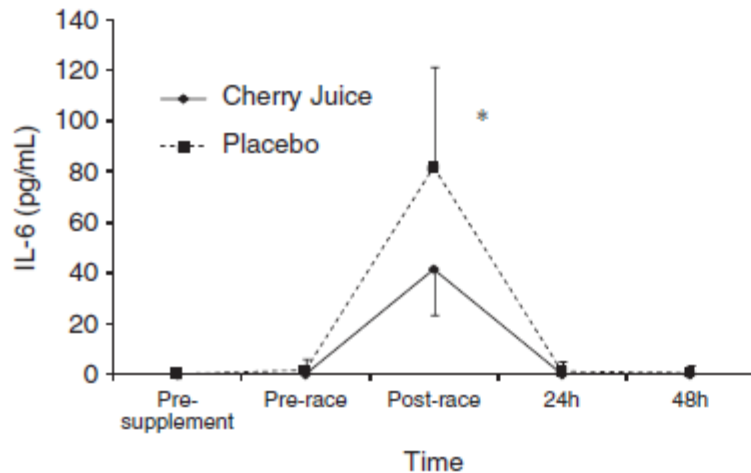


Fig. 2. Serum interleukin 6 (IL-6) concentrations for the cherry juice and placebo groups before and following Marathon running. \*Significantly lower serum IL-6 in the cherry juice group than the placebo immediately post-race ( $P < 0.05$ ); values are mean  $\pm$  SD ( $n = 10$  per group).

### PROTEINA C REATTIVA

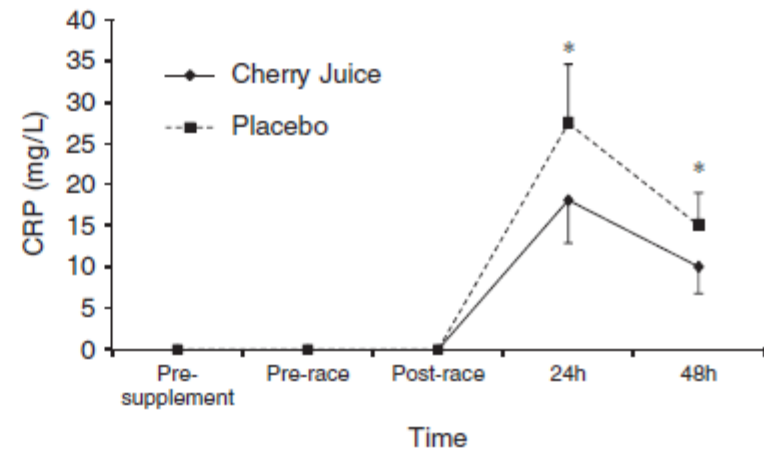
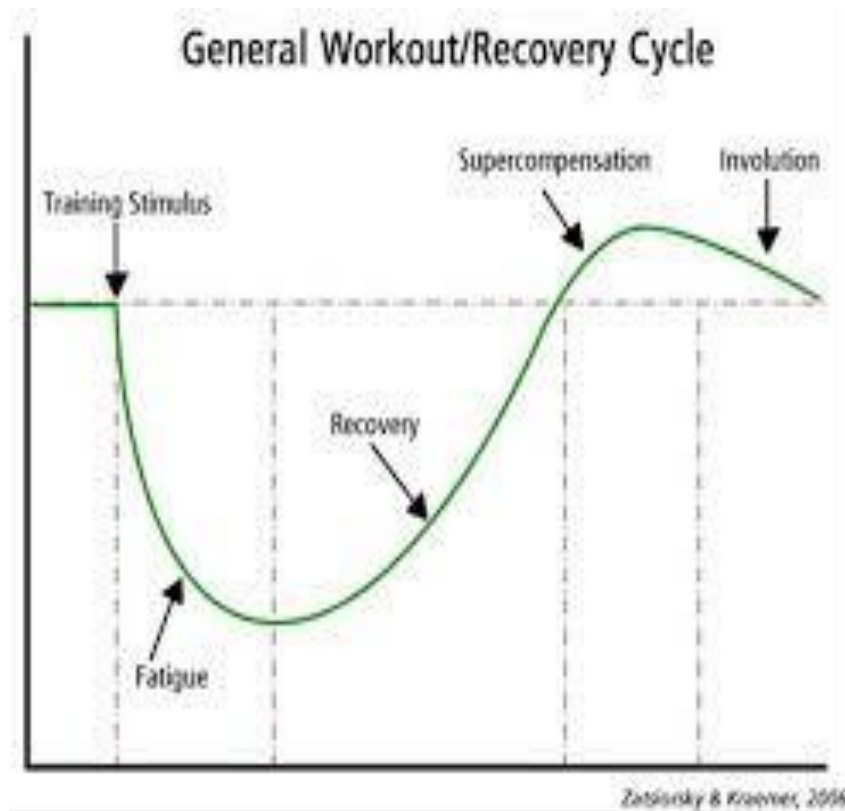


Fig. 3. Serum C-reactive protein (CRP) concentrations for the cherry juice and placebo groups before and following Marathon running. \*Significantly lower serum CRP in the cherry juice group than the placebo at 24 and 48 h post-race ( $P < 0.05$ ); values are mean  $\pm$  SD ( $n = 10$  per group).



# Oxidative Stress vs Hormonal Profile in Plasma and Saliva

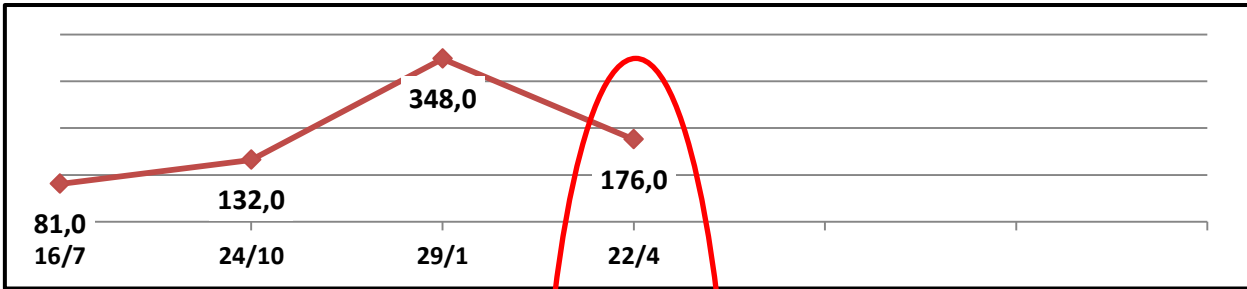


# Salivary test Analysis

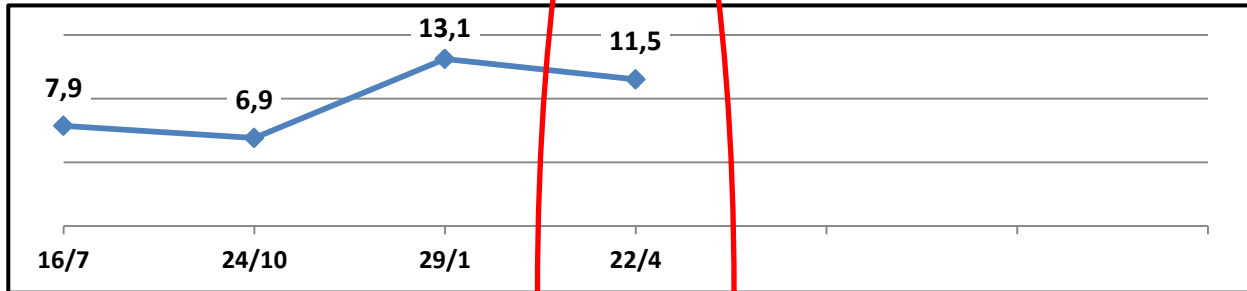


Calciatore

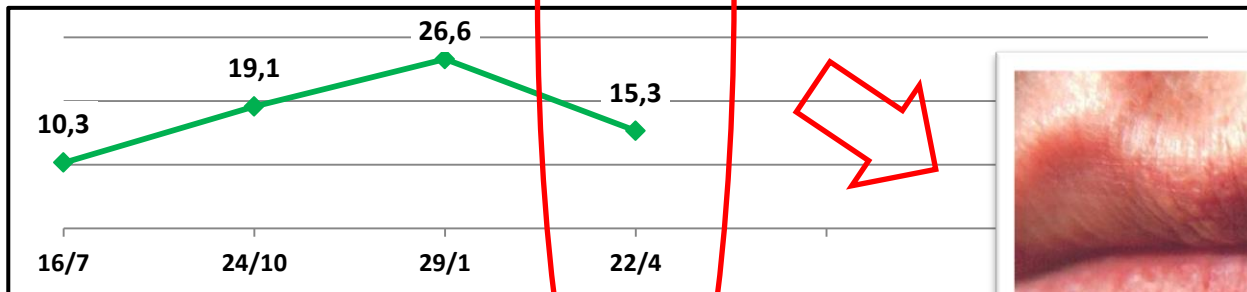
TESTOSTERONE



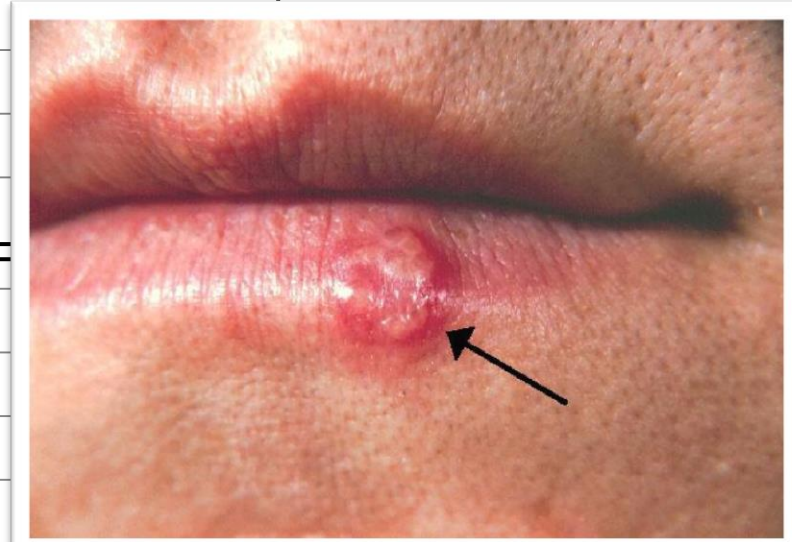
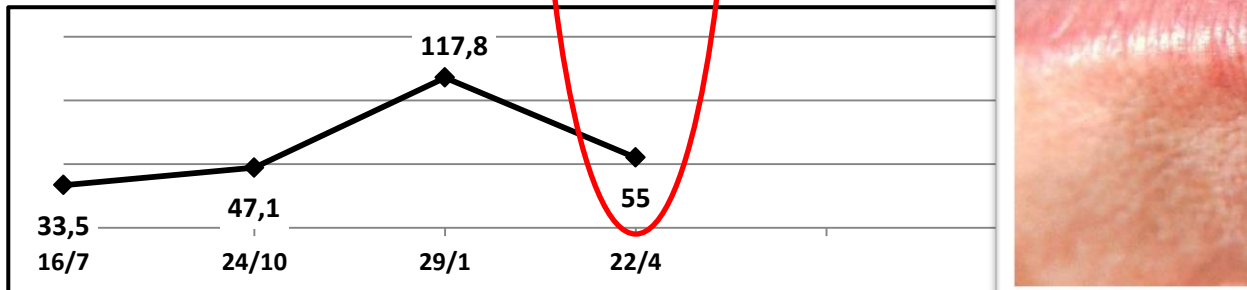
CORTISOLO



T/C



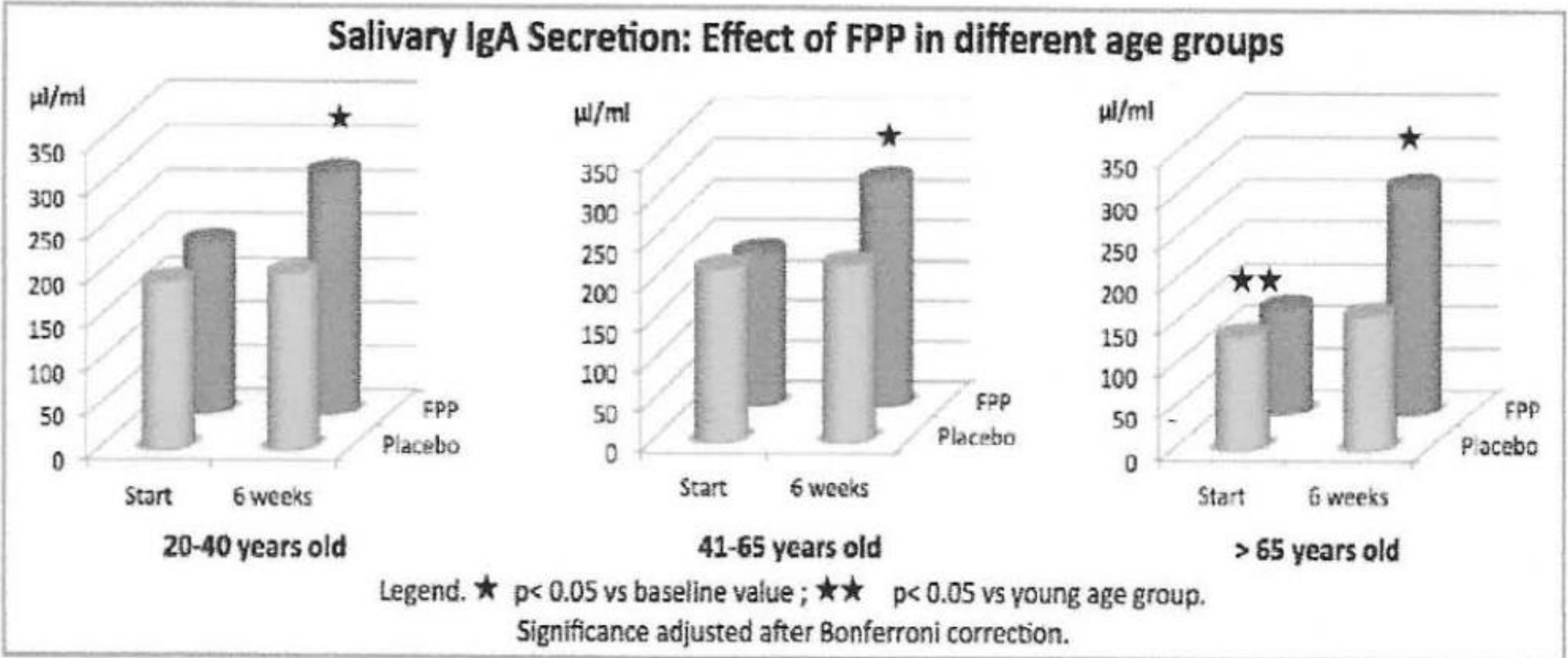
IgA



# PAPAYA FERMENTATA E URTI



Adulti sani  
GSTM1 positivi  
9 gr / die (4,5 gr per dose) x 6 settimane



**Incremento Ig A Salivari**

# CASE REPORT - TESTOSTERONE



## 1) Subject



## 3) Solution



## 2) Problem

### SYMPTOMS OF TESTOSTERONE DEFICIENCY

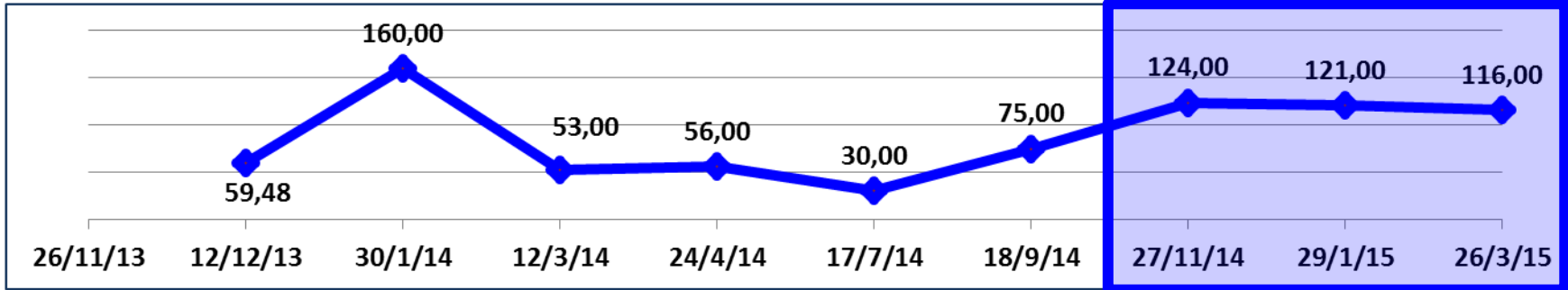
Q What symptoms are characteristic of testosterone deficiency?

- Degree of Deficiency
- Mild
- Decreased libido
  - Decreased vitality
  - **Fatigue**
  - **Mood changes**
  - Insomnia
  - Anemia
  - Delayed ejaculation
  - Flashes
  - **Erectile dysfunction**
  - Decreased muscle mass
  - Increased visceral body fat
  - Testicular atrophy
  - Weakness
  - Osteopenia/osteoporosis
  - Loss of facial, axillary and pubic hair
- Severe

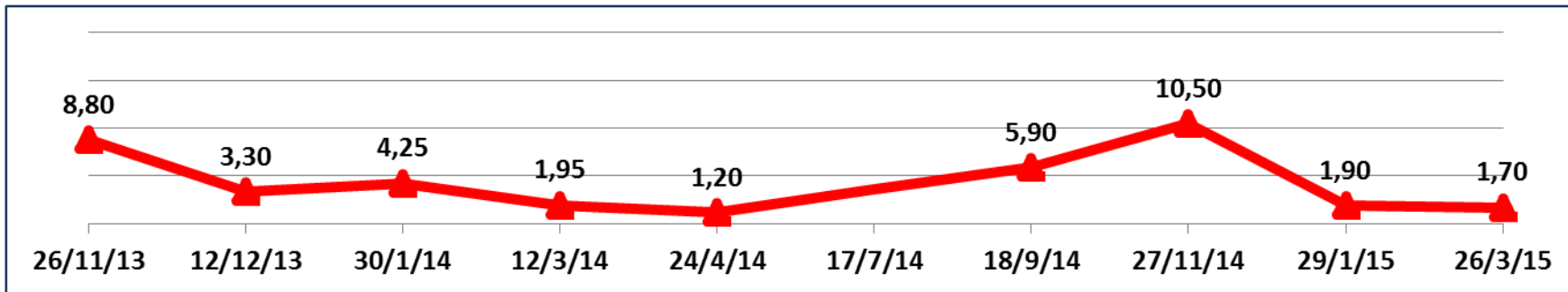
# SALIVARY HORMONE TESTING



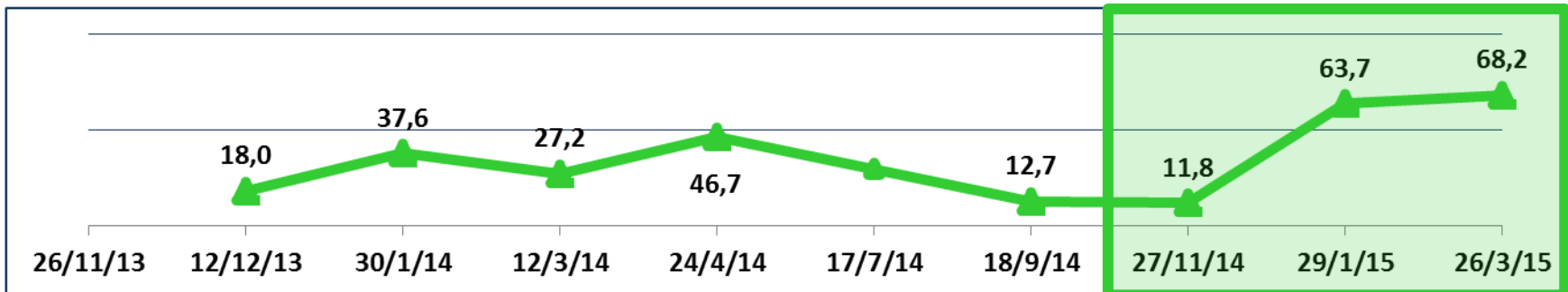
Testosterone



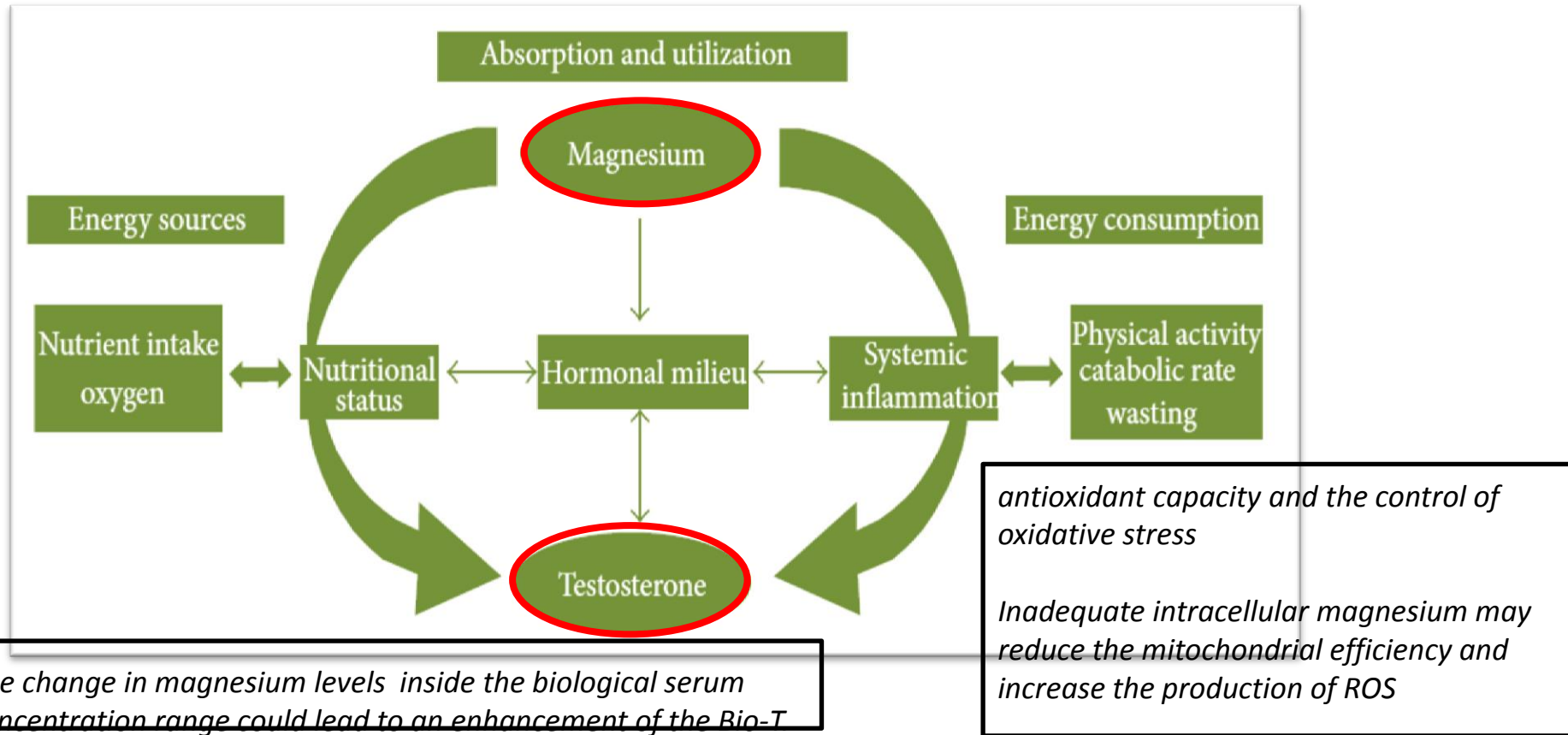
Cortisolo



T/C



# Relationship between Testosterone and Magnesium



*The activity of anabolic hormones, where T plays a central role, is influenced by **mineral status (magnesium), along with caloric and protein intake***

*The systemic inflammation, which negatively influences magnesium and T and is in turn down regulated by these 2 factors.*

# Relationship between Testosterone and Zinc



**Zinc enhances human chorionic gonadotropin-induced production of cAMP and consequently testosterone in rat testes.**

Nishi Y, Hatano S, Aihara K et al (1984) Effect of zinc ion on human chorionic gonadotropin stimulated in vitro production of cAMP and testosterone by rat testis. *Pediatr Res* 18:232

**Zinc may increase the conversion of androstenedione to testosterone in the periphery tissue.**

Bermudez JA, Perex-Pasten E, Villalpando S et al (1986) Low plasma zinc and androgen in insulin dependent diabetes mellitus. *Arch Androl* 16(2):151

**Zinc interferes with the metabolism of testosterone by decreasing its hepatic clearance and reducing hepatic 5 alpha-reductase activities.**

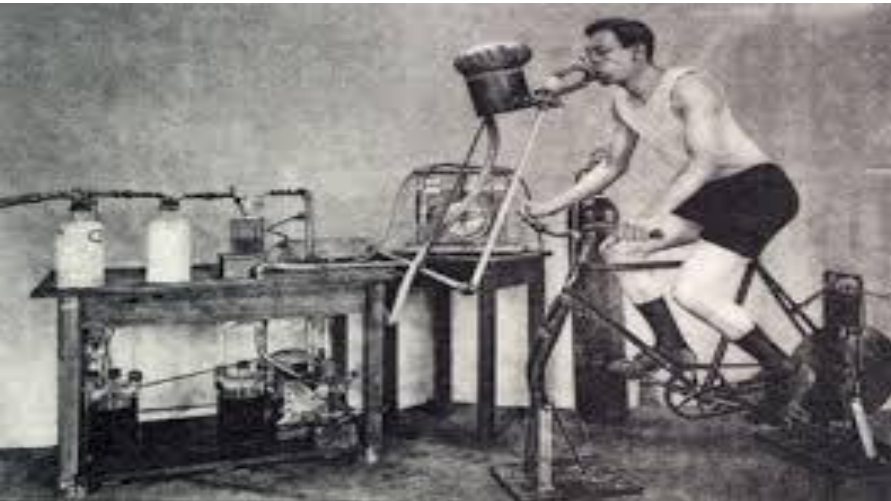
Grumbach MM, Coute FA (1992) Disorders of sex in differentiation. In: Wilson JD, Foster WD (eds) *Williams textbook of endocrinology*, 8th edn. WB Saunders Co, Philadelphia, p 853

RESEARCH ARTICLE

Open Access

# The effect of turmeric (Curcumin) supplementation on cytokine and inflammatory marker responses following 2 hours of endurance cycling

Joseph N Sciberras<sup>1\*</sup>, Stuart DR Galloway<sup>2</sup>, Anthony Fenech<sup>3</sup>, Godfrey Grech<sup>5</sup>, Claude Farrugia<sup>4</sup>, Deborah Duca<sup>4</sup> and Janet Mifsud<sup>3</sup>



## Conclusion

There is considerable debate concerning the impact of blunting cytokine and inflammatory marker responses to exercise on the adaptive stimulus to exercise [42], and further work is required to determine the effects of blunting cytokine and inflammatory marker responses to exercise on incidence of infection, and training adaptation in athletes. Given that the limited bioavailability of the polyphenol curcumin has been now improved with new preparations as used in the present study, it would seem prudent to direct more research towards athletic and clinical populations. In conclusion, the results from the present study did not reveal any statistical difference between intervention and placebo. However our interpretation based on the findings presented in this paper does not exclude the possibility of an attenuating effect on IL-6 by curcumin. This is supported by the results obtained in this study and corroborated by findings in other published studies. We conclude that the effect of curcumin supplementation on interleukins and other inflammatory markers needs to be further investigated with observations in a larger sample including examination of exercise mode, intensity effects, and curcumin dose effects.

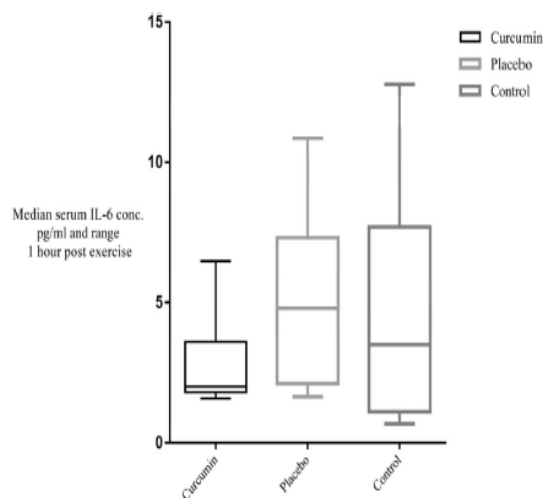


Figure 4 Median IL-6 concentration and range one hour post exercise for curcumin, placebo and control trials. Note curcumin dataset still positively skewed (towards low values) despite removing an outlier.





# The effect of *Zingiber officinale* R. rhizomes (ginger) on plasma pro-inflammatory cytokine levels in well-trained male endurance runners

FARZAD ZEHSAZ, NEGIN FARHANGI, LAMIA MIRHEIDARI

Department of Physical Education & Sport Sciences, College of Humanities and Educational Sciences, Tabriz Branch, Islamic Azad University, Tabriz, Iran



- 28 Male Runners
- Bruce's Treadmill Test (Index of Performance) 3 days before after 6 and 12 weeks of Training
- 500 mg of Ginger in capsule 3 times /day after 6 weeks of Training
- 

**Table 1.** Demographic, anthropometric and sports activity data for the control and experimental group athletes at the start of the study. Data are means ( $\pm$  SD)

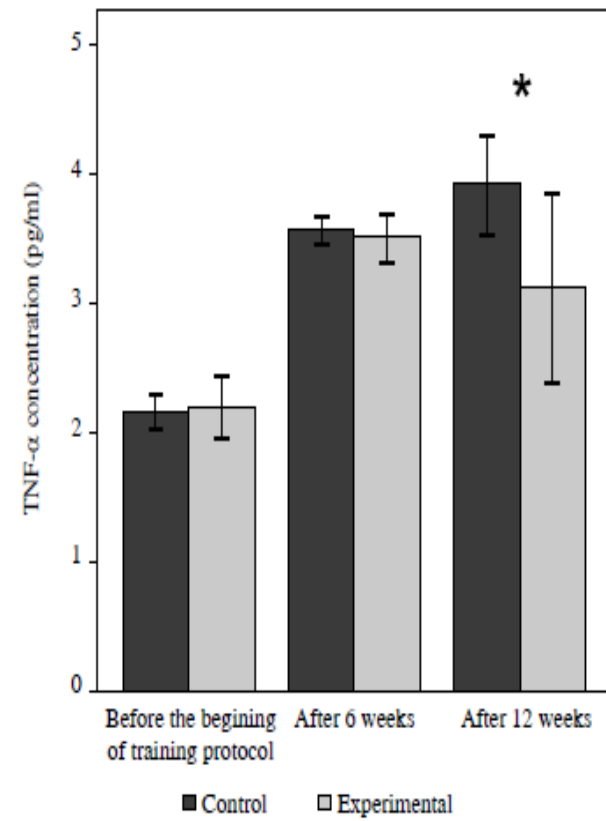
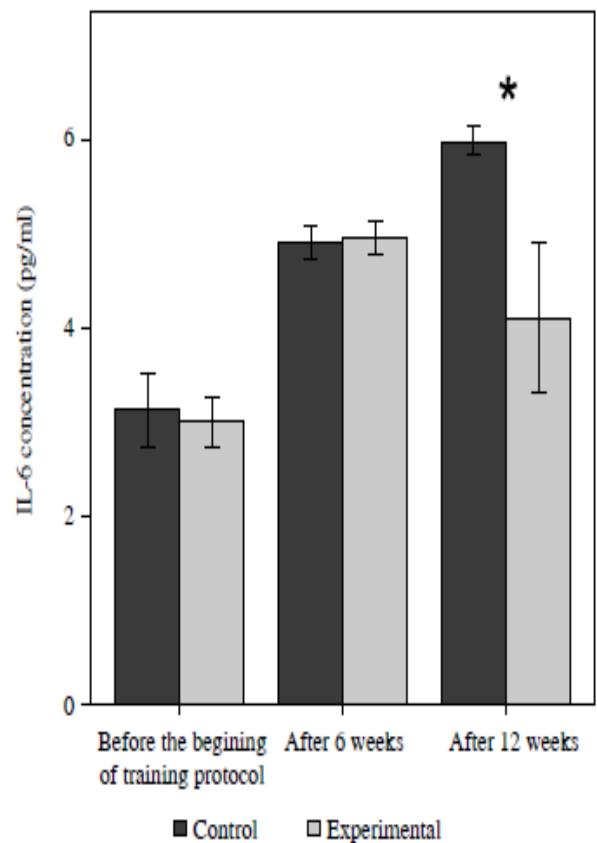
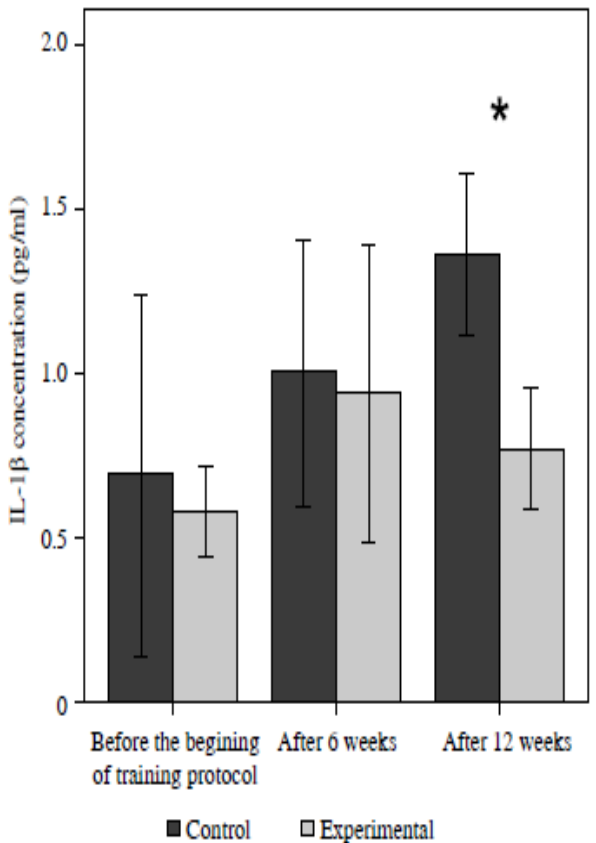
Variable	Experimental	Control
Height (cm)	1.72.93 (5.48)	1.74.57 (3.97)
Weight (kg)	65.36 (2.87)	64.93 (4.34)
Age (years)	23.21 (2.77)	22.03 (2.34)
VO <sub>2max</sub> (ml·kg <sup>-1</sup> ·min <sup>-1</sup> )	67.86 (0.75)	66.79 (1.98)
Sport experience (years)	5.14 (1.70)	4.57 (1.78)



# The effect of *Zingiber officinale* R. rhizomes (ginger) on plasma pro-inflammatory cytokine levels in well-trained male endurance runners

FARZAD ZEHSAZ, NEGIN FARHANGI, LAMIA MIRHEIDARI

Department of Physical Education & Sport Sciences, College of Humanities and Educational Sciences, Tabriz Branch, Islamic Azad University, Tabriz, Iran



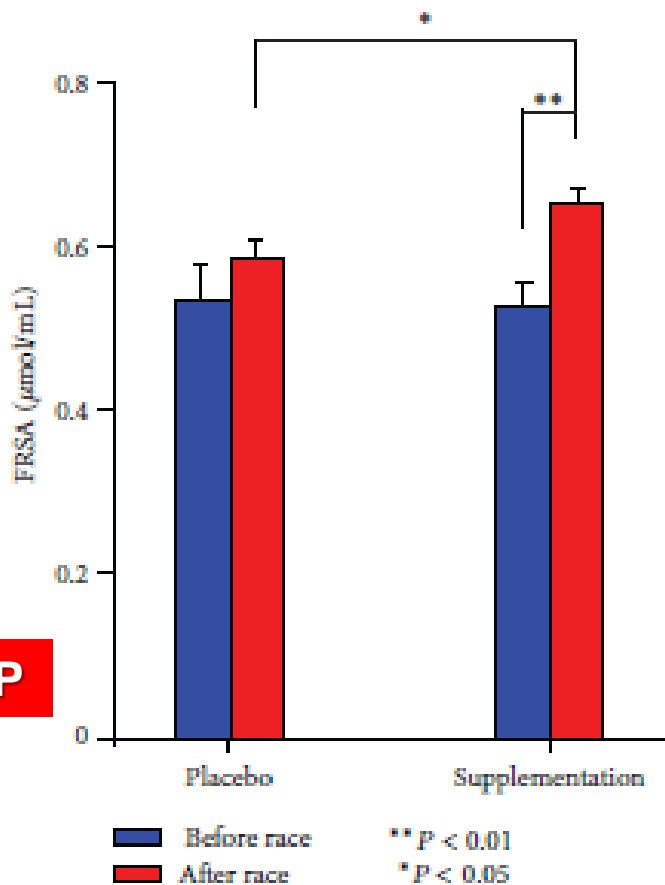
# Improving Training Condition Assessment in Endurance Cyclists: Effects of *Ganoderma lucidum* and *Ophiocordyceps sinensis* Dietary Supplementation



Paola Rossi,<sup>1</sup> Daniela Buonocore,<sup>1</sup> Elisa Altobelli,<sup>2</sup> Federico Brandalise,<sup>1</sup> Valentina Cesaroni,<sup>1</sup> Davide Iozzi,<sup>1</sup> Elena Savino,<sup>2</sup> and Fulvio Marzatico<sup>1</sup>

<sup>1</sup> Department of Biology and Biotechnology, "L. Spallanzani," Pavia University, Via Ferrata 9, 27100 Pavia, Italy

<sup>2</sup> Department of Earth and Environmental Science, Pavia University, Pavia, Italy



«We Can Conclude that 3 Months of Ganoderma and Cordyceps Supplementation may protect endurance athletes from nonfunctional effects of overreaching/overtraining ....»

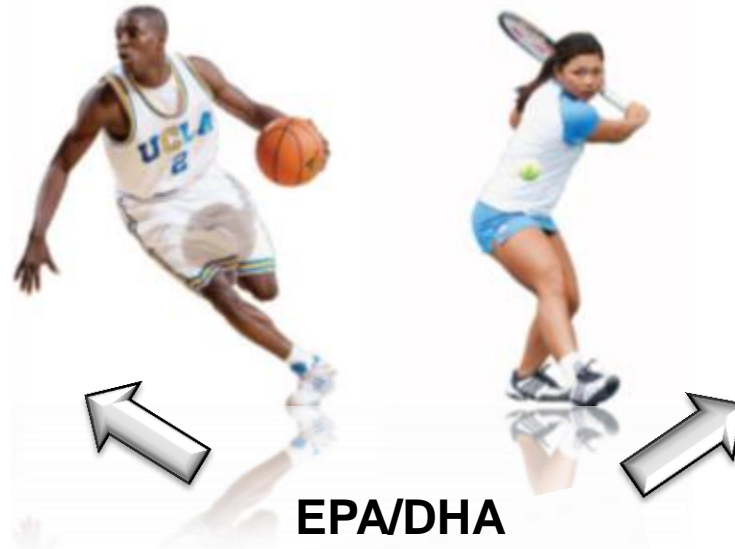


# OMEGA-3 (APPLICAZIONE NELLO SPORT)



## Controllo della risposta infiammatoria

- Dolore
- rimodellamento  
tissutale
- riparo e  
recupero



## Effetto anabolico

- Mantenimento PKB-  
mTOR

## Anticatabolico

- Modulazione  
proteolitica

EPA/DHA  
(OLIO DI PESCE)



## Sistema di supporto multiorgano

- cardio/vasoportettivo
- cervello/umore
- neuroprotezione
- muscolo scheletrico/  
ortopedia



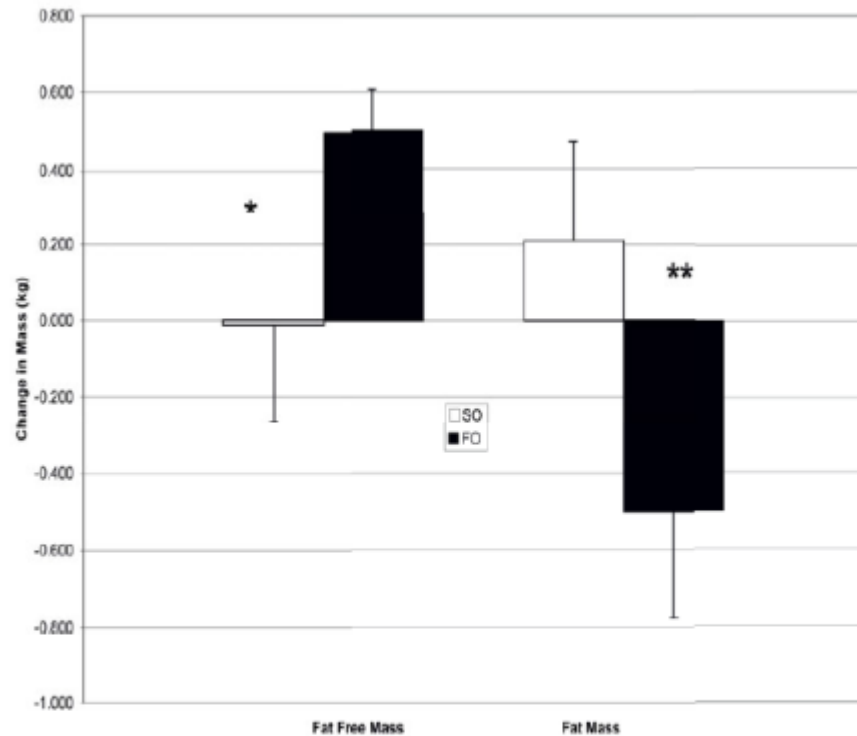
## Metabolismo/Wellness

- Sensibilità  
insulinemica
- Composizione  
corporea

# Effects of supplemental fish oil on resting metabolic rate, body composition, and salivary cortisol in healthy adults

Eric E Noreen\*, Michael J Sass, Megan L Crowe, Vanessa A Pabon, Josef Brandauer, Lindsay K Averill

**Fish oil (FO): 4 g/d  
(4 X 400 mg EPA +  
200 mg DHA)**



**Figure 1** Change in fat mass and fat free mass following 6 wk of treatment with either 4 g/d of safflower oil (SO), or 4 g/d of fish oil (FO). Data are means  $\pm$  SEM. \* significant treatment X

*The reduction in salivary cortisol following fish oil treatment was significantly correlated with the increased fat free mass and the decreased fat mass observed.*

*The reduction in salivary cortisol levels observed in the present study following fish oil supplementation likely has significant implications beyond positive changes in body composition.*

# Probiotici



## Effect of a Probiotic Intake on Oxidant and Antioxidant Parameters in Plasma of Athletes During Intense Exercise Training

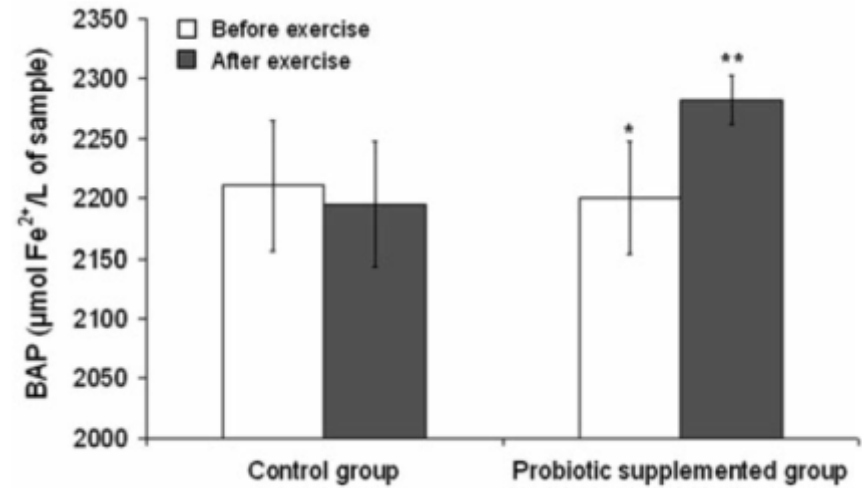
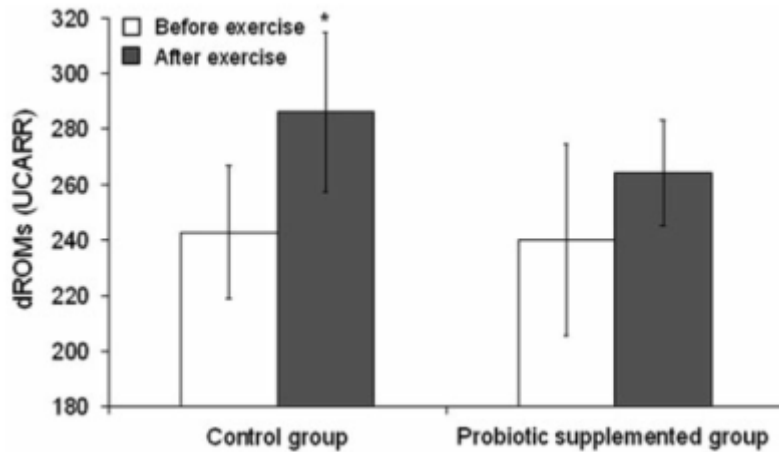
Received: 24 January 2011 / Accepted: 25 February 2011  
© Springer Science+Business Media, LLC 2011

*Martarelli, D., Verdenelli, M. C., Scuri, et al. 2011*



Investigazione dell'efficienza di *L. rhamnosus* in combinazione con *L. paracase*

- dosaggio  $2 \times 10^9$  CFU/die x 4 weeks
- Variazioni immunitarie e forte aumento livelli plasmatici antiossidanti,
- Limite: il gruppo di controllo non ha consumato nessun integratore (no effetto placebo)

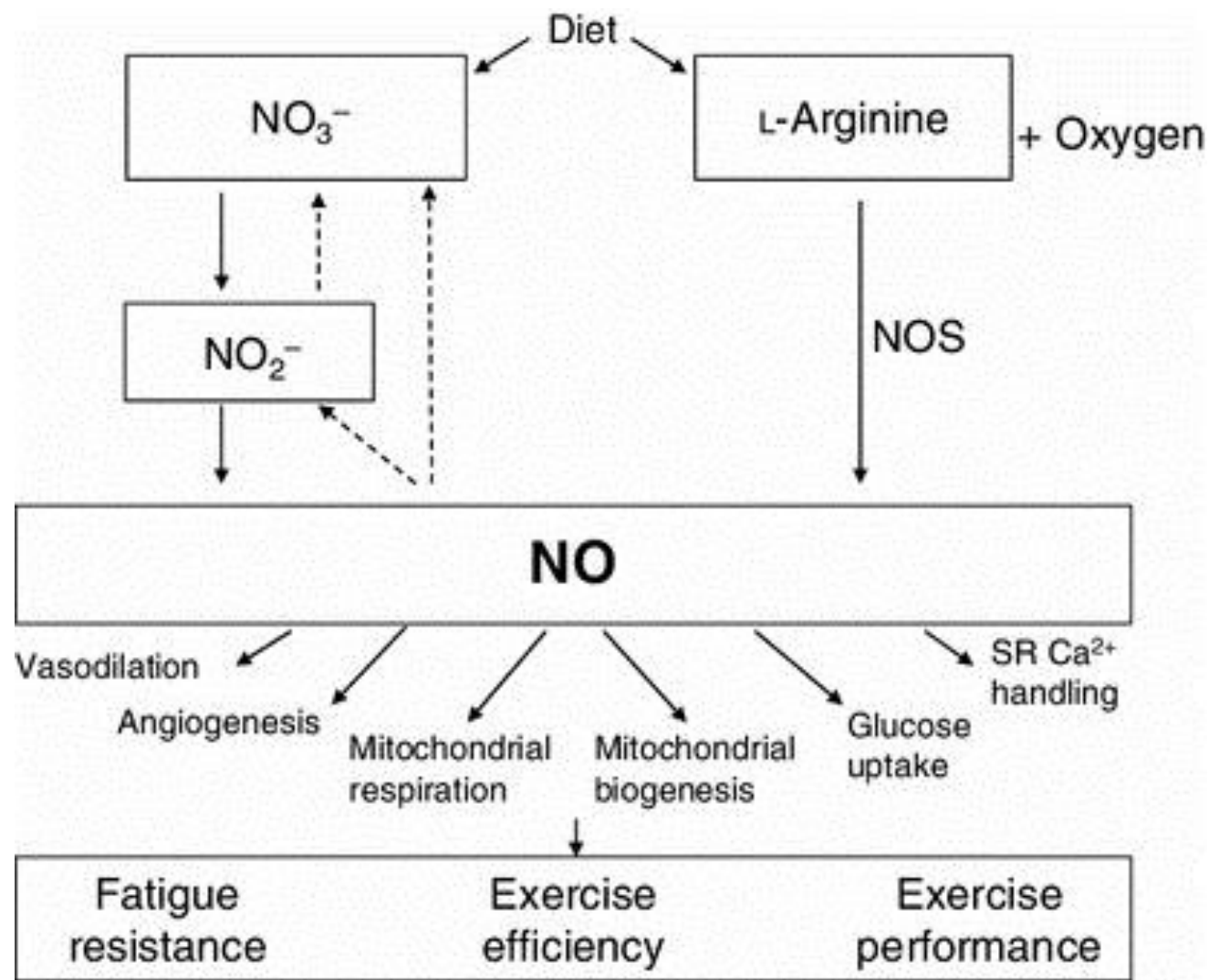


Athletes and all those exposed to oxidative stress may benefit from the ability of these probiotics to increase antioxidant levels and neutralize the effects of reactive oxygen species

# SUCCO DI BARBABIETOLA E OSSIDO NITRICO



# SUCCO DI BARBABIETOLA MECCANISMO DI AZIONE

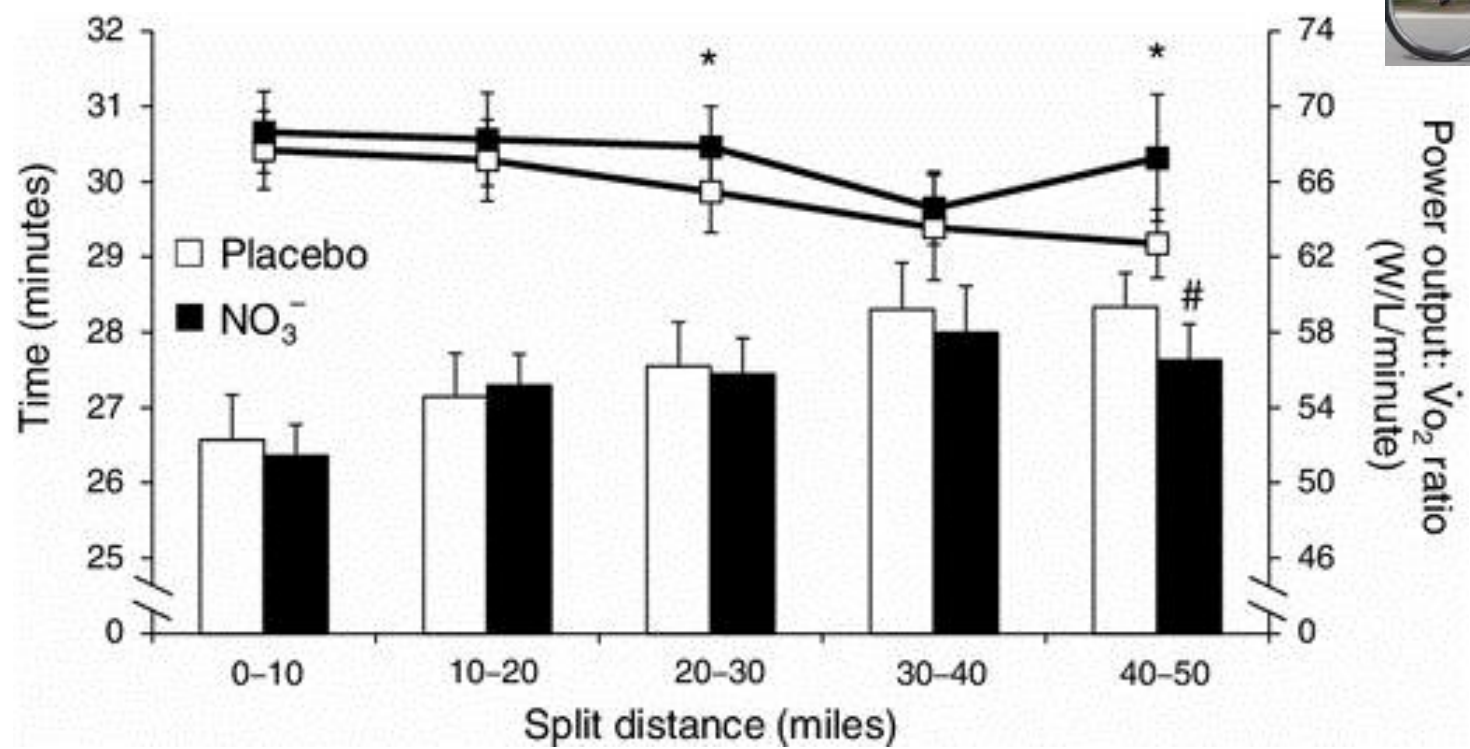




# SUCCO DI BARBABIETOLA E PERFORMANZA

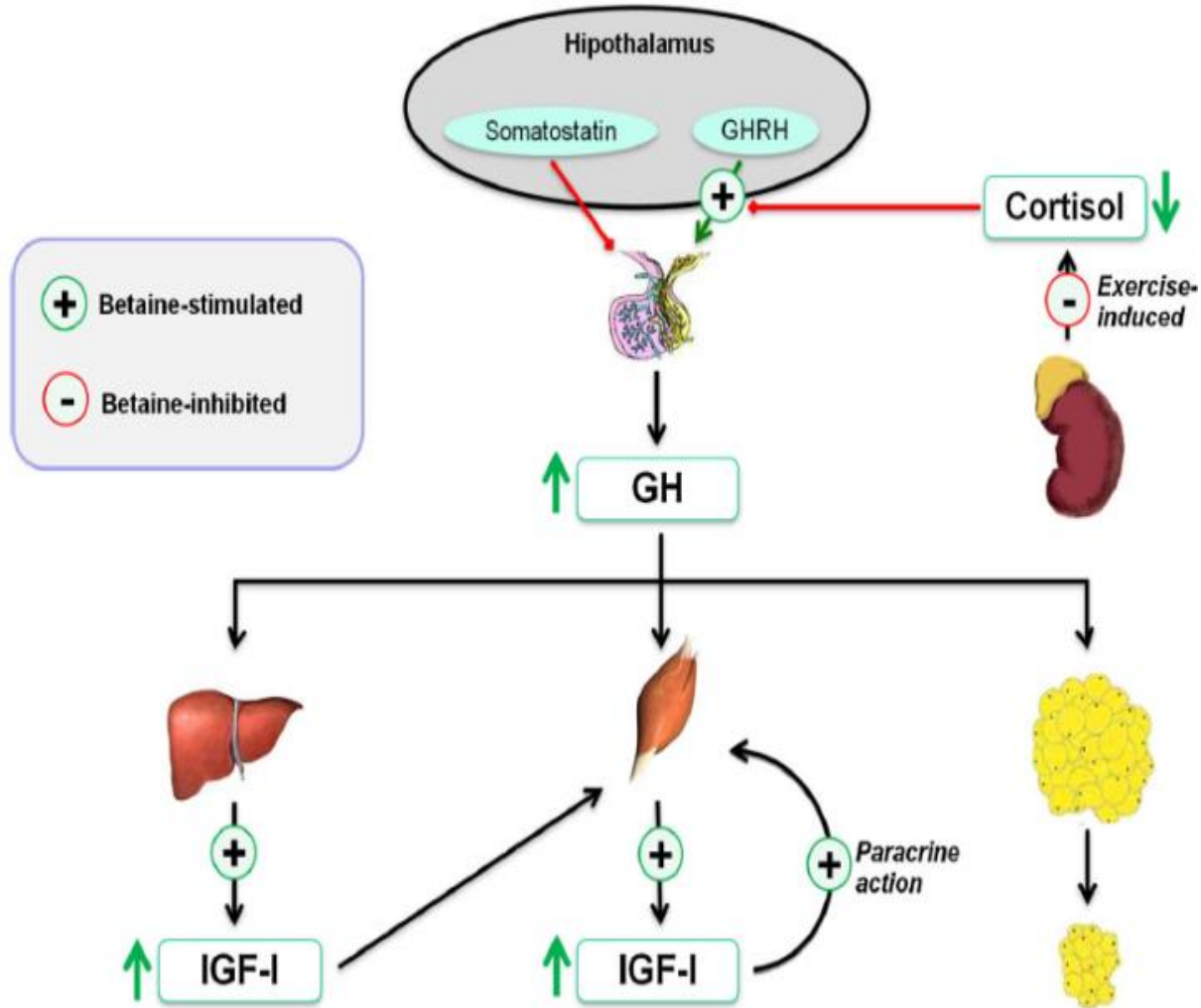


Ciclisti ben allenati  
0,5 l prima della prova  
Time Trial



**MIGLIOR TEMPO**

# BETAINA MECCANISMO DI AZIONE



# BETAINA PERFORMANCE E BODY COMPOSITION



## Journal of the International Society of Sports Nutrition



Research article

Open Access

### Effect of betaine supplementation on power performance and fatigue

Jay R Hoffman\*, Nicholas A Ratamess, Jie Kang, Stefanie L Rashti and Avery D Faigenbaum

Lee et al. *Journal of the International Society of Sports Nutrition* 2010, **7**:27  
<http://www.jissn.com/content/7/1/27>



RESEARCH ARTICLE

Open Access

### Ergogenic effects of betaine supplementation on strength and power performance

Elaine C Lee<sup>1</sup>, Carl M Maresh<sup>1\*</sup>, William J Kraemer<sup>1</sup>, Linda M Yamamoto<sup>1</sup>, Disa L Hatfield<sup>1</sup>, Brooke L Bailey<sup>1</sup>, Lawrence E Armstrong<sup>1</sup>, Jeff S Volck<sup>1</sup>, Brendon P McDermott<sup>1</sup>, Stuart AS Craig<sup>2</sup>

Cholewa et al. *Journal of the International Society of Sports Nutrition* 2013, **10**:39  
<http://www.jissn.com/content/10/1/39>



RESEARCH ARTICLE

Open Access

### Effects of betaine on body composition, performance, and homocysteine thiolactone

Jason M Cholewa<sup>1\*</sup>, Monika Wyszczelska-Rokiel<sup>2</sup>, Rafal Glowacki<sup>2</sup>, Hieronim Jakubowski<sup>3,4</sup>, Tracey Matthews<sup>5</sup>, Richard Wood<sup>5</sup>, Stuart AS Craig<sup>5</sup> and Vincent Paolone<sup>5</sup>

↑ Performance  
↓ Fatica  
↑ Fat Free Mass  
↓ Fat Mass



# To beet or not to beet?

Louise M. Burke

Australian Institute of Sport, Belconnen, Australian Capital Territory, Australia



## TO BEET OR NOT TO BEET?

Dietary Nitrate Supplementation and Exercise Performance

Reference: Andrew M. Jones, Sports Medicine, 2014 *Designed by @YLMSportScience*

### Dietary nitrate supplementation



Is growing in popularity as sports nutrition supplement



Inorganic nitrate is abundant in green leafy vegetables and beetroot



Reduces the oxygen cost of submaximal exercise and can, in some circumstances, enhance exercise tolerance and performance



There is limited evidence that nitrate is beneficial for longer duration exercise (>40 min) performance, at least when administered acutely



The duration of continuous maximal exercise for which nitrate appears to be ergogenic is in the range of 5–30 min



Two studies indicated that high-intensity intermittent exercise performance might be enhanced by nitrate supplementation. More research needed



### PROTOCOL

- 5–9 mmol of nitrate/day (~400–800 mL beetroot juice)
- 2–6 days (or up to 15 days)
- This quantity can readily be consumed within the normal diet and there is presently no evidence that additional nitrate intake produces greater benefits



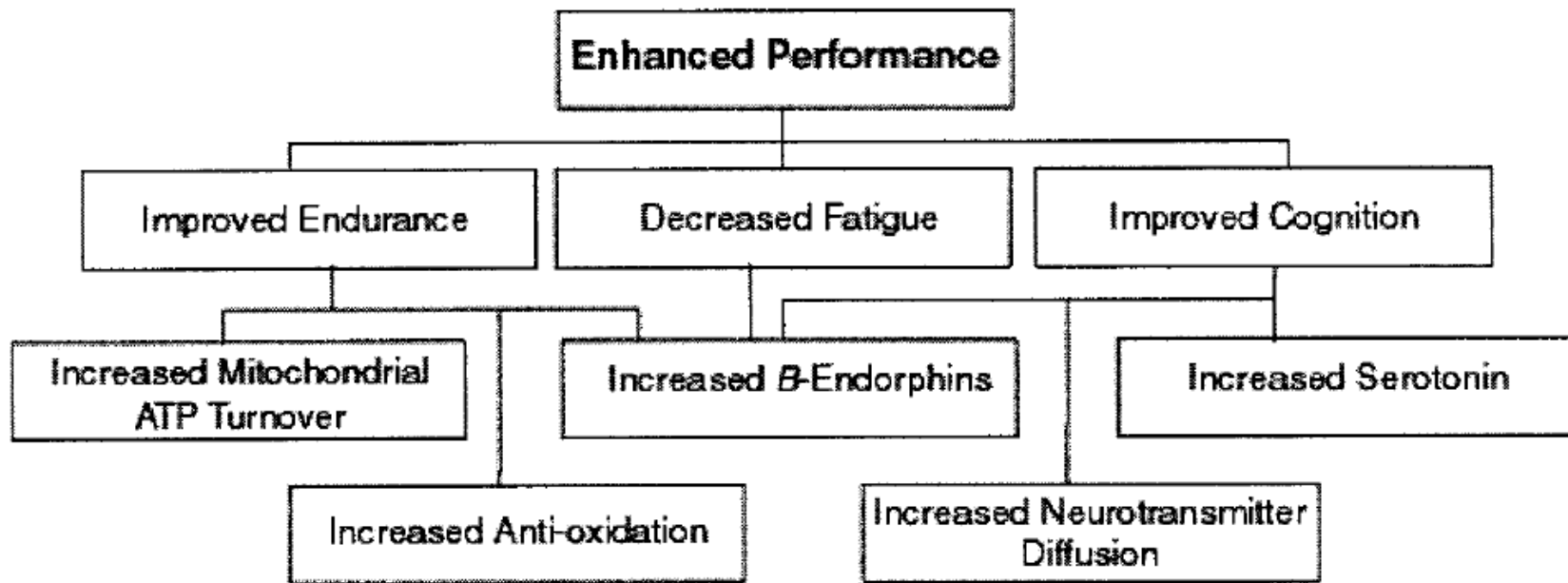
Athletes wishing to explore the possible ergogenic properties of nitrate supplementation are advised to use natural vegetable products for this purpose

at the onset of exercise. Few laboratories are likely to have the capacity to monitor oxygen kinetics during exercise as exactly as the current group, but other investigators may add to the practical application of this knowledge by testing exercise protocols that better mimic real-life sport. Whether beetroot juice will rival the study and marketing of creatine supplements is a developing story. In the meantime, many mothers and nutritionists are simply grateful that Professor Jones has accomplished a task that has eluded their own endeavors: getting boys to increase their intake of vegetables!

# RODIOLA ROSEA E PERFORMANCE



**Figure 4** — Potential mechanisms by which *Rhodiola Rosea* improves performance



BMC Complement Altern Med. 2012 May 29;12:70. doi: 10.1186/1472-6882-12-70.

## **Rhodiola rosea for physical and mental fatigue: a systematic review.**

Ishaque S<sup>1</sup>, Shamseer L, Bukutu C, Vohra S.

### **⊕ Author information**

#### **Abstract**

**BACKGROUND:** Rhodiola rosea (*R. rosea*) is grown at high altitudes and northern latitudes. Due to its purported adaptogenic properties, it has been studied for its performance-enhancing capabilities in healthy populations and its therapeutic properties in a number of clinical populations. To systematically review evidence of efficacy and safety of *R. rosea* for physical and mental fatigue.

**METHODS:** Six electronic databases were searched to identify randomized controlled trials (RCTs) and controlled clinical trials (CCTs), evaluating efficacy and safety of *R. rosea* for physical and mental fatigue. Two reviewers independently screened the identified literature, extracted data and assessed risk of bias for included studies.

**RESULTS:** Of 206 articles identified in the search, 11 met inclusion criteria for this review. Ten were described as RCTs and one as a CCT. Two of six trials examining physical fatigue in healthy populations report *R. rosea* to be effective as did three of five RCTs evaluating *R. rosea* for mental fatigue. All of the included studies exhibit either a high risk of bias or have reporting flaws that hinder assessment of their true validity (unclear risk of bias).

**CONCLUSION:** Research regarding *R. rosea* efficacy is contradictory. While some evidence suggests that the herb may be helpful for enhancing physical performance and alleviating mental fatigue, methodological flaws limit accurate assessment of efficacy. A rigorously-designed well reported RCT that minimizes bias is needed to determine true efficacy of *R. rosea* for fatigue.



**REVIEW**

**Open Access**



# Plausible ergogenic effects of vitamin D on athletic performance and recovery

Dylan T. Dahlquist<sup>2</sup>, Brad P. Dieter<sup>3</sup> and Michael S. Koehle<sup>1\*</sup>

## Conclusion

In summary, an interesting theme has emerged from animal studies that supraphysiological dosages of vitamin D<sub>3</sub> have potential ergogenic effects on the human metabolic system and lead to multiple physiological enhancements. These dosages could increase aerobic capacity, muscle growth, force and power production, and a decreased recovery time from exercise. These dosages could also improve bone density. However, both deficiency (12.5 to 50 nmol/L) and high levels of vitamin D (>125 nmol/L) can have negative side effects, with the potential for an increased mortality [121]. Thus, maintenance of optimal serum levels between 75



# **Take Home Message**

- **La Supplementazione dello Sport rappresenta un punto focale dell'intervento volto a garantire la Salute e la Performance dell'atleta sia Amatoriale che Top Level**
- **L'utilizzo dei Nutraceutici quale parte integrante del Piano Nutrizionale dell'Atleta sta suscitando sempre maggior interesse in Letteratura**
- **I limiti degli Studi in letteratura sono rappresentati dal Numero dei Partecipanti, dalla scarsità di Trial in doppio ceco e dalla durata degli Studi**
- **Un Altro Limite è dato dalla modalità di Studio che spesso prevede Test da Sforzo in Laboratorio che non riproducono in Toto le condizioni a volte estreme dell'Esercizio Fisico Testato**
- **Altro Dato da considerare riguarda poi la Purezza degli Estratti e il raggiungere Concentrazioni Stabili a livello Ematico che ne garantiscano la loro Potenziale azione sia come Ergogenici che Adattogeni**