Role of Fruits and Vegetables in Sports Medicine and Athletic Performance

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Role of Fruits and Vegetables in Athletes Diet?
Fruits & Vegetables

• FAV consumption associated with healthy diet
• FAV important dietary source of micronutrients, vitamins, minerals, and phytonutrients
• Antioxidant quality of FAV particularly important for active individuals
• A lack of antioxidants in athletes can lead to excessive ROS and nitrogen production that induce muscle damage, inflammation, immuno-suppression, susceptibility to injury, and prolonged recovery.

Fruits & Vegetables

- Sport nutritionists’ recommend that athletes increase consumption of FAV and/or antioxidants particularly during intense training periods and/or when training/competing at altitude
- Obtaining adequate amounts of FAV in diets of athletes is difficult due to digestive, time and travel constraints
- Greater use of supplemental FAV concentrates in athletes
- Interest in identifying bioactive nutrients contained in FAV for dietary supplements

Examples of Fruit & Vegetable Derived Nutritional Ergogenic Aids
Fruits & Vegetables
Theoretical Value in Sport Supplements

- Nitrates
  - Reduce afterload and blood pressure
  - Increase blood flow and nutrient delivery
- Antioxidants
  - Reduce exercise-induced oxidative stress
  - Reduce muscle damage
  - Enhance recovery
- Immune Support
  - Lessen immunosuppressive effects of intense exercise
  - Reduce incidence of URTI
- Glycemic Control
  - Enhance glycogen resynthesis
  - Improve blood glucose regulation
- Ergogenic Bioactive Extracts
Beetroot Juice/Nitrate

Apparently Effective

• NO promotes vasodilation, regulates platelet aggregation, and enhances immune function
• Studies have demonstrated that chronic (3-15 d) and acute beetroot juice intake (e.g., ~300 mg, 2-2.5 hrs prior to exercise) are associated with a consistent enhancement of exercise economy.
• Evidence is also emerging that supplementation with beetroot juice prior to exercise can enhance exercise capacity and sports performance.
• More research is needed with sports-specific protocols and trained individuals.

Australian Institute of Sport. Beetroot juice/Nitrate Fact Sheet, 2011

Tart Cherry Juice

Theoretical Ergogenic Benefit

- Consumption of foods high in polyphenols, particularly anthocyanins, have been associated with improved health.
- Tart cherry juice has antioxidant properties and is thought to activate antioxidant response genes.
- Use of tart cherry juice/concentrates theorized to reduce exercise-induced oxidative stress and muscle damage.
- Some evidence of improved weight loss in animals.
- Long-term supplementation theorized to enhance recovery and training tolerance.
Fenugreek Seed Extract
*Theoretical Ergogenic Benefits*

- Fenugreek (*Trigonella foenum-graecum*) is a leguminous, annual plant originating in India and North Africa.
- Reported to have insulin-like and anti-lipidemic properties.
- Reported to improve glucose and insulin regulation in diabetics.
- Some evidence that FG may affect glycogen resynthesis.
- FG supplementation theorized to increase glycogen replenishment, promote glucose uptake, and enhance insulin and glucose mediated creatine retention.

Quercetin
Theoretical Ergogenic Benefits

- Quercetin is a plant pigment found in many foods such as onions, apples, berries, tea, grapes and red wine.
- Classified as flavonoid
- Quercetin and rutin are used in many countries for blood vessel health and are ingredients of numerous multivitamin preparations and herbal remedies.
- Theorized to reduce immuno-suppressive effects of intense exercise, oxidative stress, and improve aerobic exercise capacity.

http://www.raysahelian.com/quercetin.html
Pumpkin Seed Extract

Theoretical Ergogenic Benefits

- Oil extracted from pumpkin seeds purported to reduce prostrate enlargement, decrease inflammation, serve as an antioxidant, and have neuro-protective effects
- Some evidence of enhanced glucose control
- Theorized to reduce oxidative stress and inflammation following intense exercise
- Theorized to improve glucose control and glycogen replenishment
Examples of Recently Marketed FAV Derived Weight Loss Supplements
Raspberry Ketones

Theoretical Benefits

- Raspberry ketone (RK) is a major aromatic compound of red raspberry (*Rubus idaeus*).
- The structure of RK is similar to the structures of capsaicin and synephrine, compounds known to exert anti-obese actions and alter the lipid metabolism.
- Theorized to increase metabolism and fat oxidation leading to weight loss.
African Mango Extract

Theoretical Ergogenic Benefits

• A novel seed extract of the traditional West African food plant (*Irvingia gabonensis*) has been reported to affect adipogenesis critical metabolic pathways including PPAR gamma, leptin, adiponectin, and glycerol-3 phosphate dehydrogenase.

• AMF could promote fat loss and appetite regulation and thereby help athletes manage weight.

• One of a number of FAV extracts believed to help manage weight
• FAV contain nutrients that have been reported to promote health
• Athletes have been reported to consume inadequate amounts of FAV
• Supplementation of FAV concentrates have been shown to enhance health in athletes
• Athletes may benefit from use of FAV derived supplements that provide:
  • Nitrates
  • Antioxidants
  • Nutrients that support immune function
  • Glycemic control
  • Ergogenic nutrients
• A number of FAV extracts are included in weight loss supplements
Fruits & Vegetables
ESNL Student Posters

• African Mango Extract – Minye Cho
• Beet Root Juice – Peter Jung
• Betaine – Majid Koozehchian
• Concentrated F&V – Adriana Coletta
• Fenugreek Extract – Chelsea Goodenough
• Grape Seed Extract – Abigail O’Connor
• Pumpkin Seed Extract – Brittany Sanchez
• Quercetin – Deepesh Khanna
• Russian Tarragon – Elfego Galvan
• Raspberry Ketones – Ryan Dalton
• Tart Cherry Powder – Kyle Levers