

# Everyone is an Athlete

Justin Robinson, MA, RD, CSSD, CSCS, FAFS



# Justin Robinson

- Registered Dietitian
- Board Certified Specialist in Sports Dietetics
- BS (Nutrition & Kinesiology) – Cal Poly, SLO
- MA (Kinesiology) – SDSU
- Rehab United Sports Performance Center
  - Director of Strength & Conditioning
  - Director of Nutrition



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# Goals for Today

Identify . . .

- 5 Sport Nutrition-Related Misconceptions
- Provide Tools/Resources for Counseling
- Provoke Thought & Discussion



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# Functional Philosophy

Functional = Purposeful

Truths of Function

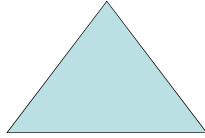
Truths of Nutrition

Life is 3-Dimensional



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### 3-Dimensional Conditioning



Mind  
Nutrition  
Intake  
Fuel

Body  
Activity  
Storage  
Prolong

Spirit  
Behavior  
Output  
Recover



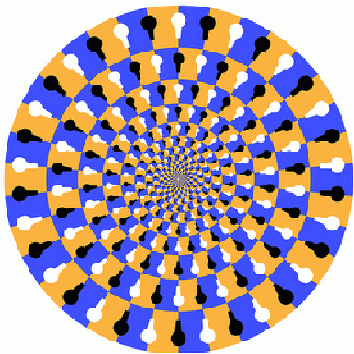
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### Sports Nutrition: Perception vs. Reality

- What Defines an Athlete?
- Is Carbohydrate Loading Effective?
- How do we Recover?
- Do Antioxidants Improve Performance?
- Does Food Provide Adequate Nutrition?



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**Perception 1**

### Perception: Athletes Have a Mold

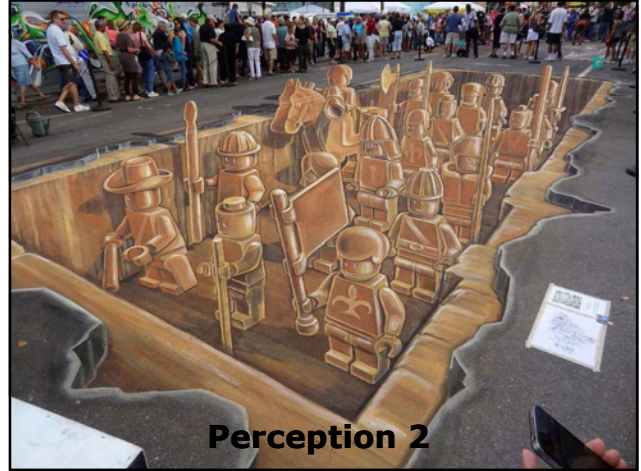


Reality: Everyone is an Athlete

# What Defines an Athlete?



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Perception 2



## Perception: Carbohydrate Loading is Essential for Endurance

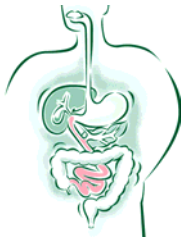


Reality: Compete how you Train

### Fuel Utilization

Gastric Emptying: (Leiper)

- Composition/Density
  - **Slow:** Pro, Fat, Fiber, Dense
  - **Fast:** Carbs, Liquid
- Volume
  - Emptying Proportional to Volume
- Others
  - Osmolality, Acidity, Temp, Viscosity



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### Carbohydrate Loading

- 4-7 Day Manipulation of CHO Intake and Exercise Duration/Intensity (Hatfield)
  - Deplete, then Supercompensate
  - 8+ g/kg per Day
- Increase Muscle Glycogen Stores
  - Up to 50% Increase
  - Extend Exercise Duration (not Intensity)



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### Carbohydrate Loading

- Impractical
  - Unpracticed
  - Unnecessary for Events <90 min
- Gut is "Trainable"
  - Increase Consumption?
  - Compete on Empty?
    - Bob Seebohar - "Metabolic Efficiency"



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### Prolong


- Maintain Hydration
  - Know Sweat Rate!
  - 16 oz per Pound Lost
- Maintain Blood Glucose
  - ~1 g CHO/min (60 g, 240 kcal/hour)
  - M<sub>x</sub> Forms of CHO = ↑ Absorption (Jentjens)



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### Perception: High Protein for Recovery



Reality: Replace what you Burn



### Optimal Recovery


STRESS  
↓  
STRAIN  
↓  
**RESTING**  
↓  
**ADAPTATION**



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### Recovery Starts Before Exercise

- Protein Ingestion Before Exercise
  - 2-3 Hours to Reach Peak Levels
  - Greater Protein Synthesis – 6g EAA (Tipton)

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## Recovery & Regeneration

- Fluid-Electrolyte-Energy Ingestion
  - **Nutritional “Truth”**
  - Reverse Catabolic Condition
- Hormone Responses
  - Testosterone, GH, IGF-I, Insulin
  - Increased AA, Glucose Uptake
  - Protein Synthesis to Promote Remodeling



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## Recovery Nutrition

- Fluids
  - Hydration: 20-24 oz/lb Lost (1.5 L/kg)
- Electrolytes
  - Sodium: 0.5 g/L (100-150 mg/8 oz)



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## Recovery Nutrition

- Carbohydrate
  - Glycogen Replenishment, Insulin Response
  - 0.75 g/lb (1.5 g/kg) <sup>(ADA)</sup>
- Protein
  - Protein Synthesis, Insulin Response
  - 0.15-0.25 g/lb (0.3-0.5 g/kg) <sup>(ADA)</sup>

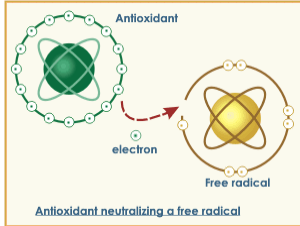


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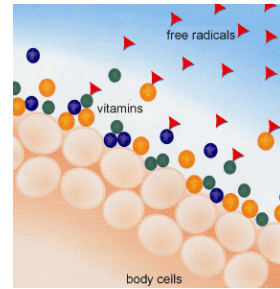
Perception 4

### Perception: Exercise-Induced Oxidation Requires Antioxidant Intake



Reality: Excessive Antioxidants  
may Alter Training Effects

### Antioxidants



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### Antioxidants



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### Antioxidants

- Injured Fibers  $\uparrow$  Intracellular  $Ca^{2+}$ 
  - Activates Phospholipases
  - Releases Fatty Acids
    - Oxidized to Free Radicals (ROS)
  - Activates Proteolytic Enzymes
- Vit C, Vit E
  - Do Athletes Require More?
  - Is Supplementation Beneficial?



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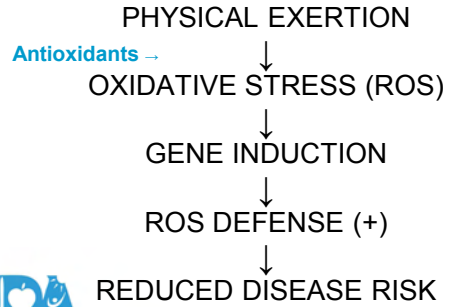
### Vitamin C and E

- Supplementation with Vit C (Carmen-Gomez)
  - Decreases Training Efficiency
- Supplementation with Vit C, E (Ristow)
  - No Change in Insulin Sensitivity
- Excessive Antioxidant Supplementation:
  - Shuts Down Gene Expression
  - Shuts Down Immune Response Pathways

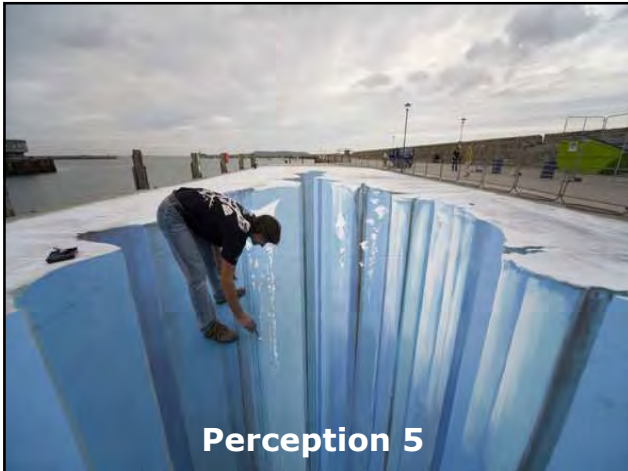


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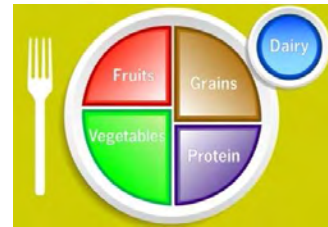
### Mitohormesis



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### Perception: Whole Food Provides all Nutrients



Reality: Supplementation Necessary (on some level)



### The Winner Is . . .

*The Following MAY Positively Influence Health and Performance:*

Quercetin (KWAIR-suh-ten)

- Combined w/Green Tea Extract (Catechin)
- Improved Immune Function
- Increased Work Capacity
- Main Ingredient in FRS

• [www.frs.com/frs-quercetin-scientific-studies](http://www.frs.com/frs-quercetin-scientific-studies)



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### The Winner Is . . .

Tart Cherry Juice

- Anti-Inflammatory and Antioxidant Effects (Kuhel)
- Decreased Muscle Soreness
- Improved Recovery from Exercise
- Improved Inflammatory Markers



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### The Winner Is . . .

Tumeric

- Anti-Inflammatory Properties
- Curcumin – Principle Component
- Research Mostly in Medicine



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### Summary

*The truth does not change . . . Our understanding of truth is ever-changing*

- Gary Gray, PT



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## Conclusions (Truths)

**Exercise is Good**  
**Eat Natural, Healthy Foods**  
**More Research is Needed**



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## Resources

- *National Strength & Conditioning Association*
  - [www.nscs-lift.org](http://www.nscs-lift.org)
  - Performance Training Journal
  - Sports Nutrition Program
- *Gatorade Sports Science Institute*
  - [www.gssiweb.org](http://www.gssiweb.org)
  - Sports Science Library
- *Stack Magazine*
  - [www.stack.com](http://www.stack.com)
  - STACK TV – “Fuel”
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Questions?

[jrobinson@rehabunited.com](mailto:jrobinson@rehabunited.com)

