Performance vs Aesthetics

Danielle Rancourt, MS, RD, LD
Due to evolving research, sports nutrition recommendations are being modified on a regular basis.
What does *healthy* mean?
LEARNING OBJECTIVES: PERFORMANCE NUTRITION

1) Understand the general principles of sport & performance nutrition
2) Summarize current recommendations for pre-, during and post-exercise nutrient intake and timing
3) Differentiate fueling plans for endurance vs strength athletes
4) Identify an appropriate fluid replacement protocol
5) Discuss the most common vitamin and mineral deficiencies that impair performance
6) Analyze the alleged and actual benefits of various supplements
7) Examine the role of caffeine in exercise performance
8) Create an appropriate diet for weight management
PERFORMANCE PYRAMID

Sport-specific Nutrient Protocols (Pre-game/Post-game)

Daily Eating Habits “The Basics”

SUPPLEMENTATION

PERFORMANCE NUTRITION

FOUNDATIONAL NUTRITION

85 - 90% of athletes have deficiencies in one or more key nutrients*

PERFORMANCE NUTRITION

nu-tri-tion (noun)

The process of providing or obtaining the food necessary for health and growth – EATING FOR LIFE

Performance nutrition

- Meeting specific nutritional needs (carbs, protein, fat, calories, vitamins, minerals) to support & enhance performance
- Meeting specific fluid needs (hydration) to support & improve performance
- Timing food and fluid intake to optimize performance and recovery
- Utilizing supplements to “fill the gaps”
PERFORMANCE NUTRITION

FACTORS TO CONSIDER:

✓ Body type & composition (body fat %, lean muscle mass)
✓ Athletic goals
✓ Type of exercise (endurance vs strength training)
✓ Time of exercise (morning vs evening)
✓ Frequency of exercise (one-a-day, two-a-day)
✓ Environmental conditions (temperature, humidity, elevation)

OUR CONSIDERATIONS:

➢ **Endurance Athlete** (aerobic system dominant)
➢ **Strength-Training Athlete** (anaerobic system dominant)
PERFORMANCE NUTRITION

DAILY RECOMMENDATIONS: CALORIES

- Cunningham Equation → athletic body types (requires body fat %)
- Harris-Benedict Equation

<table>
<thead>
<tr>
<th></th>
<th>BMR formula</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Men</strong></td>
<td>$BMR = 88.362 + (13.397 \times \text{weight in kg}) + (4.799 \times \text{height in cm}) - (5.677 \times \text{age in years})$</td>
</tr>
<tr>
<td><strong>Women</strong></td>
<td>$BMR = 447.593 + (9.247 \times \text{weight in kg}) + (3.098 \times \text{height in cm}) - (4.330 \times \text{age in years})$</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exercise Level</th>
<th>Daily kilocalories needed = BMR x 1.2</th>
<th>Daily kilocalories needed = BMR x 1.375</th>
<th>Daily kilocalories needed = BMR x 1.55</th>
<th>Daily kilocalories needed = BMR x 1.725</th>
<th>Daily kilocalories needed = BMR x 1.9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Little to no exercise</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Light exercise (1–3 days per week)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderate exercise (3–5 days per week)</td>
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<td></td>
</tr>
<tr>
<td>Heavy exercise (6–7 days per week)</td>
<td></td>
<td></td>
<td></td>
<td><strong>Daily kilocalories needed = BMR x 1.725</strong></td>
<td></td>
</tr>
<tr>
<td>Very heavy exercise (twice per day, extra heavy workouts)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>Daily kilocalories needed = BMR x 1.9</strong></td>
</tr>
</tbody>
</table>

*From The American Journal of Clinical Nutrition*

**CASE STUDY: 21 YO MALE HOCKEY PLAYER (Freshman)**

185 lb. (84kg), 5’10” (178cm), Trains M-F (5X per week), Skates 2-3X per week

$BMR = [88.362 + (13.397 \times 84)] + (4.799 \times 178) - (5.677 \times 21) = 1949 \text{ kcal} \times 1.725 = 3362 \text{ kcal/day}$

“Sports nutrition is not one-size-fits-all and should be adapted to the athlete, his or her goals, and his or her sport”
# Endurance vs Strength Sports

<table>
<thead>
<tr>
<th>Ranking</th>
<th>Sport</th>
<th>Ranking</th>
<th>Sport</th>
</tr>
</thead>
<tbody>
<tr>
<td>=1</td>
<td>Cycling: Distance</td>
<td>11</td>
<td>Ice Hockey</td>
</tr>
<tr>
<td>=1</td>
<td>Track and Field: Distance</td>
<td>=11</td>
<td>Tennis</td>
</tr>
<tr>
<td>3</td>
<td>Swimming (all strokes): Distance</td>
<td>=13</td>
<td>Canoe/Kayak</td>
</tr>
<tr>
<td>4</td>
<td>Skiing: Nordic</td>
<td>=13</td>
<td>Field Hockey</td>
</tr>
<tr>
<td>5</td>
<td>Boxing</td>
<td>=13</td>
<td>Rugby</td>
</tr>
<tr>
<td>6</td>
<td>Rowing</td>
<td>=16</td>
<td>Lacrosse</td>
</tr>
<tr>
<td>7</td>
<td>Water Polo</td>
<td>=16</td>
<td>Wrestling</td>
</tr>
<tr>
<td>8</td>
<td>Soccer</td>
<td>18</td>
<td>Figure Skating</td>
</tr>
<tr>
<td>9</td>
<td>Speed Skating</td>
<td>19</td>
<td>Racquetball/Squash</td>
</tr>
<tr>
<td>10</td>
<td>Basketball</td>
<td>20</td>
<td>Track and Field: Middle Distance</td>
</tr>
</tbody>
</table>
### ENDURANCE ATHLETE

- **Carbohydrate**: 6 – 10 g/kg body weight
- **Protein**: **1.2 – 1.4 g/kg body weight**
- **Fat**: 20 – 35% of total calories
- **Fluid**: ½ - 1 oz per pound of body weight per day*

*Post-exercise fluid intake not included in total (to replace sweat loss)

### STRENGTH TRAINING ATHLETE

- **Carbohydrate**: 6 – 10 g/kg body weight
- **Protein**: **1.4 – 1.7+ g/kg body weight**
- **Fat**: 20 – 35% of total calories
- **Fluid**: ½ - 1 oz per pound of body weight per day*

*Post-exercise fluid intake not included in total (to replace sweat loss)

ICE HOCKEY = ENDURANCE + STRENGTH

ESTIMATED ENERGY NEEDS: 3000-3300kcal
- Carbohydrate: 45-55%
- Protein: 25-30%
- Fat: 25%

CASE STUDY: DAILY NUTRIENT NEEDS

<table>
<thead>
<tr>
<th></th>
<th>Endurance</th>
<th>Strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbohydrate</td>
<td>55%</td>
<td>45%</td>
</tr>
<tr>
<td>Protein</td>
<td>20%</td>
<td>25%</td>
</tr>
<tr>
<td>Fat</td>
<td>25%</td>
<td>30%</td>
</tr>
</tbody>
</table>

- Carbohydrates (346g) 45%
- Fat (88g) 26%
- Protein (218g) 29%
GOAL: FILL THE TANK (Ensure sufficient fuel)

† Digestible carbohydrates to sustain energy levels & boost performance
† Lean protein to preserve muscle mass
† Healthy fats to protect joints & prevent tissue breakdown
† Fluid to stay hydrated & avoid dehydration

RECOMMENDATIONS:

<table>
<thead>
<tr>
<th>TIMING</th>
<th>NUTRIENTS</th>
<th>ENDURANCE ATHLETE</th>
<th>STRENGTH-TRAINING ATHLETE</th>
<th>CASE STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 – 4 hours prior to exercise</td>
<td>Carbohydrate</td>
<td>2 – 3 g/kg</td>
<td>0.5 – 0.7 g/kg</td>
<td>84g carbs (2 cups rice)</td>
</tr>
<tr>
<td></td>
<td>Protein</td>
<td>0.4 – 0.5 g/kg</td>
<td>0.5 – 0.6 g/kg</td>
<td>42g protein (6 oz chicken)</td>
</tr>
<tr>
<td></td>
<td>Fat</td>
<td>5 – 15 grams</td>
<td>5 – 15 grams</td>
<td>5g fat (1/4 avocado)</td>
</tr>
<tr>
<td></td>
<td>Fluid</td>
<td>5 – 7 mL/kg</td>
<td>5 – 7 mL/kg</td>
<td>1 cup per hour</td>
</tr>
<tr>
<td>0 – 1 hour prior to exercise</td>
<td>Carbohydrate</td>
<td>0.5 – 1.5 g/kg</td>
<td>0.2 – 0.4 g/kg</td>
<td>15-45g carbs (banana)</td>
</tr>
<tr>
<td></td>
<td>Protein</td>
<td>0.1 – 0.2 g/kg</td>
<td>0.2 – 0.4 g/kg</td>
<td>8-25g pro (2 Tbsp PB)</td>
</tr>
<tr>
<td></td>
<td>Fat</td>
<td>minimal</td>
<td>minimal</td>
<td>minimal</td>
</tr>
<tr>
<td></td>
<td>Fluid</td>
<td>5 mL/kg</td>
<td>5 mL/kg</td>
<td>1 cup</td>
</tr>
</tbody>
</table>
Carbohydrates fuel muscles and are the quickest source of energy for athletes.

Healthy Fats
Moderate amounts of healthy fats provide a concentrated energy source and essential fatty acids.
[nuts, seeds, oil and fatty fish]

Protein
Protein foods are essential for building/repairing muscle and helping to support immune function.

Fruits & Veggies
Many fruits and vegetables provide nutrients that have been linked to reduced oxidative damage from hard training.

Fluids
Stay hydrated by drinking fluids at mealtime and throughout the day.

For advice on customizing a nutrition plan, consult a sports dietitian.
GOAL: MAINTAIN

- Fluids to stay hydrated & avoid dehydration
- Carbohydrates to provide immediate fuel
- Protein to prevent muscle breakdown

RECOMMENDATIONS:

<table>
<thead>
<tr>
<th>TIMING</th>
<th>NUTRIENTS</th>
<th>ENDURANCE ATHLETE</th>
<th>STRENGTH-TRAINING ATHLETE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 60 minutes</td>
<td>Carbohydrate</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td></td>
<td>Protein</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td></td>
<td>Fat</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td></td>
<td>Fluid</td>
<td>4 – 8 oz/15 minutes</td>
<td>4 – 8 oz/15 minutes</td>
</tr>
<tr>
<td>Longer than 60 minutes</td>
<td>Carbohydrate</td>
<td>0.7 g/kg/hour</td>
<td>0.3 g/kg/hour</td>
</tr>
<tr>
<td></td>
<td>Protein*</td>
<td>15 g/hour</td>
<td>15 g/hour</td>
</tr>
<tr>
<td></td>
<td>Fat</td>
<td>none</td>
<td>none/minimal</td>
</tr>
<tr>
<td></td>
<td>Fluid</td>
<td>4 – 8 oz/15 minutes</td>
<td>4 – 8 oz/15 minutes</td>
</tr>
<tr>
<td></td>
<td>Electrolytes – Sodium**</td>
<td>450 – 700 mg</td>
<td>450 – 700 mg</td>
</tr>
</tbody>
</table>

*Only for specific populations – long training sessions, multiple sessions, gaining mass
**Varies based on sweat rate (0.3 – 2.4 L/hour)
**POST-EXERCISE NUTRITION**

**GOAL: RE-FILL THE TANK ASAP**
- Protein to repair & restore *lean muscle mass*
- Carbohydrates to *re-fuel & improve future performance*
- Healthy fats to decrease *inflammation & muscle soreness*
- Fluid to *re-hydrate*

**RECOMMENDATIONS:**

<table>
<thead>
<tr>
<th>TIMING</th>
<th>NUTRIENTS</th>
<th>ENDURANCE ATHLETE</th>
<th>STRENGTH-TRAINING ATHLETE</th>
<th>CASE STUDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 – 30 minutes post exercise</td>
<td>Carbohydrate</td>
<td>1.0 – 1.5 g/kg</td>
<td>1.0 – 1.5 g/kg</td>
<td>84g carbs</td>
</tr>
<tr>
<td></td>
<td>Protein</td>
<td>0.4 – 0.6 g/kg</td>
<td>0.4 – 0.6 g/kg</td>
<td>34-42g protein</td>
</tr>
<tr>
<td></td>
<td>Fat</td>
<td>5 – 15 grams</td>
<td>5 – 15 grams</td>
<td>5g-15g fat</td>
</tr>
<tr>
<td></td>
<td>Fluid</td>
<td>16 – 24 oz per 1 lb lost</td>
<td>16 – 24 oz per 1 lb lost</td>
<td>“Shaker bottle”/lb lost</td>
</tr>
<tr>
<td>Every 2 hours post exercise (for 4 – 6 hours)</td>
<td>Carbohydrate</td>
<td>1.0 – 1.5 g/kg</td>
<td>1.0 – 1.5 g/kg</td>
<td>126g carbs</td>
</tr>
<tr>
<td></td>
<td>Protein</td>
<td>0.4 – 0.5 g/kg</td>
<td>0.5 – 0.6 g/kg</td>
<td>42g protein</td>
</tr>
<tr>
<td></td>
<td>Fat</td>
<td>10 – 20 grams</td>
<td>10 – 20 grams</td>
<td>10-20g fat</td>
</tr>
<tr>
<td></td>
<td>Fluid</td>
<td>8 – 16 oz/2 hours</td>
<td>8 – 16 oz/2 hours</td>
<td>“1/2 shaker bottle”/2h</td>
</tr>
</tbody>
</table>
Take weight pre & post-exercise

**0 – 30 minutes post-exercise:**
- 16 – 24 oz of water for every 1 lb of weight lost
- 1 shaker bottle (25oz) per lb lost

**Every 2 hours post-exercise:**
- 8 – 16 oz of water/2 hours
  - ½ shaker bottle (12 oz) every 2 hours

- Limit alcohol, energy drinks, soda, caffeine
Supplementation works best when the athlete has a healthy, established diet.

That is NOT the case for dietary supplements.

Dietary supplements are not required to be registered with or obtain pre-market approval by the FDA.”
# SUPPLEMENTATION: FILL THE GAPS

<table>
<thead>
<tr>
<th>SUPPLEMENT</th>
<th>STRONG EVIDENCE</th>
<th>WEAK EVIDENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Whey Protein</strong></td>
<td>Increases fat loss</td>
<td>Increases power output</td>
</tr>
<tr>
<td></td>
<td>Increases lean muscle mass</td>
<td></td>
</tr>
<tr>
<td><strong>Creatine</strong></td>
<td>Increases power output</td>
<td>Increases muscle endurance</td>
</tr>
<tr>
<td></td>
<td>Increases weight &amp; lean muscle mass</td>
<td>Protects muscles from damage</td>
</tr>
<tr>
<td></td>
<td>Increases anaerobic cardiovascular capacity</td>
<td></td>
</tr>
<tr>
<td><strong>BCAA’s</strong></td>
<td>Increases aerobic endurance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Increases fat oxidation</td>
<td>Increases weight loss</td>
</tr>
<tr>
<td></td>
<td>Decreases fatigue</td>
<td></td>
</tr>
<tr>
<td><strong>Fish Oil</strong></td>
<td>Decreases inflammation</td>
<td>Decreases cortisol levels</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Caffeine</strong></td>
<td>Increases anaerobic cardiovascular capacity</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Increases power output</td>
<td>Increases fat oxidation</td>
</tr>
<tr>
<td></td>
<td>Increases aerobic exercise capacity</td>
<td></td>
</tr>
<tr>
<td><strong>Beta-Alanine</strong></td>
<td>Increases muscle endurance</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Increases anaerobic cardiovascular capacity</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Decreases fatigue</td>
</tr>
<tr>
<td><strong>HMB (metabolite of Leucine)</strong></td>
<td>Decreases muscle damage</td>
<td>Increases power output</td>
</tr>
<tr>
<td><strong>Glucosamine</strong></td>
<td>None</td>
<td>Decreases pain</td>
</tr>
<tr>
<td><strong>L-Arginine (nitric oxide)</strong></td>
<td>None</td>
<td>Increases blood flow</td>
</tr>
</tbody>
</table>

From www.Examine.com
SUPPLEMENTS: USE AND SOURCES

- 2004 study involving Division I athletes; 89% of the subjects had used supplements or were using supplements
  - Energy drinks, meal replacements, MV, Creatine, Vit C

Females
- Calcium, Iron, MV
- Health, recovery, and replacing an inadequate diet
- Family members

Males
- Amino acids, whey protein, weight gainers, creatine, glutamine, HMB
- Improve speed and agility, strength and power, or for weight/muscle gain
- Store nutritionist, fellow athletes, friends, or a coach

- Multi-sport athletes tend to engage in supplement use more frequently
- Supplement use is more prevalent in aesthetic sports or sports requiring athletes to “make weight”
SUPPLEMENTS: VITAMINS & MINERALS

Role of Micronutrients (Vitamins & Minerals):

- Energy production
- Hemoglobin synthesis
- Bone health
- Immune function
- Protection against oxidative damage
- Synthesis and repair of muscle tissue

“There is no scientific evidence to support the general use of vitamin and mineral supplements to improve athletic performance.” - ACSM

Who may benefit from a daily MV and Mineral supplement?
“Athletes who restrict energy intake or have severe weight-loss practices, who eliminate one or more of the food groups from their diet, or who consume unbalanced and low micronutrient-dense diets” - ACSM/ADA/DC

Vitamin Deficiencies (1 or more):

- 40% of males
- 25% of females

Mineral Deficiencies (1 or more):

- 55% of males
- 42% of females

Table 1.

### VITAMINS & MINERAL DEFICIENCIES

<table>
<thead>
<tr>
<th>%</th>
<th>VITAMINS</th>
<th>PERFORMANCE ROLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>95</td>
<td><strong>Vitamin D</strong></td>
<td>Facilitates Calcium Absorption into Bones</td>
</tr>
<tr>
<td>65</td>
<td><strong>Vitamin E</strong></td>
<td>Protect Cell Membrane from Oxidative Damage (antioxidant)</td>
</tr>
<tr>
<td>30</td>
<td>Vitamin B6</td>
<td>Energy Production</td>
</tr>
<tr>
<td>25</td>
<td>Riboflavin</td>
<td>Energy Production</td>
</tr>
<tr>
<td>20</td>
<td>Thiamin</td>
<td>Energy Production</td>
</tr>
</tbody>
</table>
| 20 | **Vitamin B12** | Red Blood Cell Production  
                       | Protein Synthesis  
                       | CNS Maintenance |
| 15 | Folate       | Red Blood Cell Production  
                       | Protein Synthesis  
                       | CNS Maintenance |
| 10 | Niacin       | Energy Production                                          |
| ~  | Pantothenoic Acid & Biotin | Energy Production                                      |

<table>
<thead>
<tr>
<th>%</th>
<th>MINERALS</th>
<th>PERFORMANCE ROLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>80</td>
<td><strong>Zinc</strong></td>
<td>Supports Growth, Building &amp; Repair of Muscle Tissue</td>
</tr>
<tr>
<td>50</td>
<td><strong>Calcium</strong></td>
<td>Growth, Maintenance &amp; Repair of Bone Tissue</td>
</tr>
<tr>
<td>45</td>
<td>Selenium</td>
<td>Protect Cell Membrane from Oxidative Damage (antioxidant)</td>
</tr>
</tbody>
</table>
| 40 | Magnesium    | Cellular Metabolism  
                       | Neuromuscular Function                                    |
| 20 | Sodium, Potassium & Chloride | Electrolyte Balance  
                       | Nerve Transmission                                        |
| 10*| Iron         | Part of Oxygen-Carrying Proteins, Hemoglobin & Myoglobin   |

*Most prevalent in female athletes

CAFFEINE

✦ Most widely used stimulant in the world
✦ *Many use caffeine or energy drinks to compensate for poor diets*
✦ 10% of the population ingests more than 1000 mg per day
✦ Up to 400 milligrams (mg) of caffeine per day considered “safe” for most adults
  ✦ 4 cups of brewed coffee (100mg/8oz)
  ✦ 10 cans of cola
  ✦ 2 "energy shot" drinks.
CAFFEINE AND EXERCISE PERFORMANCE

RECOMMENDATION

- 3-6mg/kg 60 minutes pre-exercise (optimal dose for maximizing performance)
  - Prolonged endurance exercise, high intensity intermittent exercise
- Greater dosages ≠ greater benefits
- Side effects
  - Anxiety, jitters, inability to focus, gastrointestinal unrest, insomnia, irritability, dehydration (diuretic)
- With higher doses
  - Heart arrhythmias and mild hallucinations

SPARK: Key Benefits (per label)
- Enhances mental energy and focus*
- Provides support for long-lasting energy*
- Helps fight occasional drowsiness*
- Over 20 vitamins, minerals and nutrients*
- Sugar-free*
Whole foods contain powerful compounds and chemicals that work synergistically to improve the nutritional potential of the diet, far beyond what is possible from individual nutrients or supplements.
## WEIGHT MANAGEMENT

- **Weight Maintenance** = BMR x Activity Factor
- **Weight Gain** = BMR x Activity Factor + 15 - 20% kcal surplus per day
- **Weight Loss** = BMR x Activity Factor – 15 - 20% kcal deficit per day

Sustainable weight loss is approx. 0.5 – 1.5 lb per week

1 pound of fat = 3500 kcal

**EXAMPLE** – 180 lb runner has goal weight of 170 lb

BMR + AF = 3000 kcal/day

3000 x 0.2 = 600 kcal deficit

Athlete follows a 2400 kcal/day diet

6 days to lose 1 lb of fat & 2 months to lose 10 lb

**NOTE:**

Extreme calorie deficits can lead to weight/fat retention
Nutrient elimination not effective
## CASE STUDY: BODY COMPOSITION

### SUMMER GOALS
- Increase weight (lean mass)
- Decrease body fat %
- Improve fitness test parameters

<table>
<thead>
<tr>
<th></th>
<th>JUNE</th>
<th>AUGUST</th>
<th>DIFF</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WEIGHT</strong></td>
<td>185 lbs</td>
<td>187 lbs</td>
<td>+2</td>
</tr>
<tr>
<td><strong>FAT WEIGHT</strong></td>
<td>19 lbs</td>
<td>15 lbs</td>
<td>-4</td>
</tr>
<tr>
<td><strong>LEAN WEIGHT</strong></td>
<td>166 lbs</td>
<td>172 lbs</td>
<td>+6</td>
</tr>
<tr>
<td><strong>BODY FAT %</strong></td>
<td>10.5%</td>
<td>7.9%</td>
<td>-2.6%</td>
</tr>
<tr>
<td><strong>FAT FREE MASS</strong></td>
<td>44.8 lbs</td>
<td>46.4 lbs</td>
<td>+1.6</td>
</tr>
<tr>
<td><strong>BMR</strong></td>
<td>1996 kcal</td>
<td>2055 kcal</td>
<td>+59</td>
</tr>
</tbody>
</table>
FITNESS TESTING PARAMETERS

VERTICAL JUMP (Total body power)
JUNE: 24.7 inches
AUGUST: 32.1 inches
DIFF: +7.4 inches

BIKE TEST
(Keiser 500 kcal test-Aerobic Capacity)
JUNE: 26:30
AUGUST: 22:30
DIFF: -4:00

FMS (Movement Efficiency)
JUNE: 15/21 (71%/C-)
AUGUST: 18/21 (85%/B)
DIFF: +14%
SUMMARY: WHAT WE KNOW

1. Nutrition “prescriptions” should be individualized based on the athlete’s sport, goals, response to certain foods and food preferences.
2. Athletes need to consume adequate fuel during periods of high-intensity and/or long duration training.
3. The right fuel at the right time influences how well athletes feel, perform and recover.
4. Nutritional needs to achieve specific goals are not fixed.
5. Supplements can do more harm than good if taken in large amounts or at the wrong time.
1) Discuss popular diet myths and misconceptions
2) Examine common approaches for improving body composition
   A. Males Vs Female tendencies
   B. Very Low Calorie Diets
   C. Low Carbohydrate Diets
      I. Case Study: Ketogenic Diet
   D. Intermittent Fasting
   E. IIFYM (“Macros”)
      I. Case Study: Natural body builder, Bikini competitor
3) Uncover the best dietary approach
4) Compare PERFORMANCE vs AESTHETICS nutrition
5) DIETITIAN TAKEWAYS
FOODS TO AVOID

BREAD

GLUTEN

CARBS

FAT

SUGAR
**METABOLISM**

**What is it?**
- Series of chemical processes in each cell that turns calories into fuel

**Fact or Myth?**
- Certain foods can “speed up your metabolism”.
- Increasing lean mass can increase metabolic rate.
- Drastic weight loss (crash diets) can slow resting metabolism.
“It does not matter what time of day you eat. It is what and how much you eat and how much physical activity you do during the whole day that determines whether you gain, lose, or maintain your weight.” USDA

- **Why does the “7pm” cut-off exist?**
  - People eat at night for a variety of reasons that often have little to do with hunger:
    - Satisfying cravings
    - Boredom
    - Stress
  - Bedtime snacks often consist of large portions of high-calorie foods

- **Tips for eating at night**
  - Plan for it as part of your daily calories
  - Pay attention to your food while eating
    - Slow down
  - Avoid eating in front of the TV
  - Try having your last meal 2 hours before bed
    - Eating too close to bedtime can cause indigestion and sleeping problems
  - Think light and healthy: portion control!
    - Avoid eating out of the bag or box
    - Veggies and hummus, small servings of light popcorn, low-fat Greek yogurt, small handful of unsalted nuts

Arble, D., Journal of Obesity, 2009
GLUTEN MAKES YOU FAT – FACT OR MYTH?
“This is pretty sad cause I don’t know.”

“It’s in bread. It’s like a grain, right?”

“It makes you fat. I have a girlfriend in Russia who got me into it; she’s reading a book about it.”

“It’s part of the wheat that... yeah I really don’t know.”
GLUTEN MAKES YOU FAT – FACT OR MYTH?

- What is Gluten?
  - Proteins (glutenin and gliadin) found in wheat, rye and barley which stretch and trap gas as dough rises, creating airy bread.
  - Only 1% of the US population suffers from celiac disease
  - 22% of Americans currently follow a gluten-free diet
  - 65% of consumers who eat or used to eat GF do so because they think it’s healthier
  - 27% eat GF for weight loss purposes

- Who should be on a Gluten Free Diet?
  - “The vast majority of individuals on gluten-free diets have no business being gluten-free, because, for them, there is no medical necessity” - Alessio Fasano, M.D., director of the Center for Celiac Research and Treatment
  - There is no evidence that it is beneficial for people who do not have these conditions. It’s all about overall food choices made within the diet.
  - “A gluten-free diet should consist mostly of naturally gluten-free whole foods, including fruits, veggies, beans, nuts, seeds, dairy, fish, and lean meats. The ironic thing is that these are the same foods we recommend to the general population for a healthful diet.”

Mintel global Press Team, Oct 14 2013
COMMON APPROACHES TO LOSE WEIGHT AND/OR LEAN OUT

MALE VS FEMALE TENDENCIES

FEMALES:

- DIETING
  - Very Low Calorie Diets (VLCD)
  - Limit carbs, sugar and/or fat
  - Cleanses/Detox - What do these diets do that your kidney’s/liver can’t do?

MALES:

- EXERCISE
  - Many men feel it is an efficient way to lose weight

- DIET
  - “Plenty of men go on diets, they're just much more likely to do it as a solitary endeavor”
    - Psychologist Michael R. Lowe
  - Very high protein and/or high fat
  - Heavy reliance on supplements (i.e. fat burners)
VERY LOW CALORIE DIETS

- Used to promote quick weight loss (jumpstart obesity programs)
- Should only be used short term (up to 12 weeks)
- Provides up to 800 calories per day (far less than most people need)
- Commercial formulas*, liquid shakes, soups, or bars, replacing all regular meals
  (*designed to provide all nutrients all while losing weight quickly)

**PROS:**
- Rapid weight loss can be motivating (lose 3-5lbs/week)

**RISKS:**
- Fatigue, constipation, nausea, diarrhea, *gallstones*
- Weight regain is common

*National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) niddk.nih.gov*
LOW CARBOHYDRATE DIETS

BRANDED DIETS: ATKINS, SOUTH BEACH, ZONE (PALEO, KETO)

- ≤35-40% CARBS, 30-35% PRO, 30-55% FAT

**PROS:**
- Quick initial weight loss
  - Expulsion of previously retained water (4g water stored for each gram glycogen)
- Improved triglycerides
- Anti-inflammatory

**CONS, RISKS, & CHALLENGES:**
- Increased saturated fat intake (increase LDL, cholesterol)
- Unsustainable (dietary fatigue)- 6 months
- Weight regain
  - Carbs added back in without adjusting fats and protein
  - Research indicates that only 1/5 people in the general population are successful at long-term weight maintenance
- Exercise performance (endurance aerobic, high intensity)
- Nutrient deficiencies (fiber, vitamin C, folate, Mg, K, Ca, B1, B2, B6)

Levine MJ, JADA. 2006; 106: 2086-2094
LOW CARBOHYDRATE DIETS: THE KETOGENIC DIET

+ Extremely low carb, moderate protein, very high fat
  + <5-10% carbs (30g)
  + 20-30% protein
  + 60-70% fat

+ Ketosis: Fatty acids and ketones used for fuel

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<tr>
<th>PROS</th>
<th>CONS</th>
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<tr>
<td>-REDUCED APPETITE</td>
<td>-VEGETABLE LIMIT</td>
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<td>-LESSENED BLOATING</td>
<td>-LOW ENERGY</td>
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<tr>
<td>-WEIGHT LOSS</td>
<td>-DECREASED MUSCULAR ENDURANCE</td>
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<td>-DECREASED BODY FAT</td>
<td>-LIGHT HEADED</td>
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<td>-LESS FREQUENT CARB/SUGAR CRAVINGS</td>
<td>-EATING OUT (SOCIAL)</td>
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<td>-DEHYDRATION</td>
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Ketogenic Diet Weight Changes

Weight (lbs)


128.6 127.4 126.3 125.2 125 124.4 125 125 124.6 124.6 123.6 123 122.6 123.2 123.6 123.6 124.4 123.6

EXOS © 2014 Athletes’ Performance, Inc.
### INTERMITTENT FASTING

- Eating pattern that cycles between periods of fasting and eating.
  - 5:2 (2 days per week, <500kcal females, <600kcal males)
  - EAT STOP EAT – 24h fast (1-2 days per week)
  - LEANGAINS - 16:8 (Men), 14:10 (Women)

### 3 KEYS TO SUCCESS
- Calorie control, Food Quality, Regular Exercise

### HOW & WHY IT WORKS
- Dieters eat less in one week than they normally would
- Does not lower resting metabolic rate - Less muscle loss

### TAKEAWAYS:
- Not for everyone – Pregnant/Nursing, DM (hypglycemia), Medications, Hypotension, ED
  - Best for non-snackers, people who are “too busy to eat”, people who do not tend to “binge eat”
- IF (bigger meals, less frequent) does not necessarily produce greater fat loss than smaller meals, more frequently
- Weight regain upon stopping IF can occur more quickly
- Trial fasting – great way to practice managing hunger

### PURPORTED BENEFITS
- Increase HGH, improved insulin sensitivity cellular repair initiation, reduced inflammation, may reduce lipid levels

**IIFYM – FLEXIBLE DIETING**

- Requires you to calculate and monitor calories from each MACRONUTRIENT
- Aim to get 1g protein per pound body weight
- 25-35% fat
- Carbs – Leftover calories

**WHAT IT MIGHT BE**
- Extremely time consuming
- Excuse to eat unhealthy foods
- High Protein Diet

**TAKEAWAYS:**
- Results likely due to calorie control
- Not evidence-based
- Tracking may lead to an unhealthy relationship and obsession with food
- QUALITY MATTERS (especially for long term health)
  - Calorie ≠ Calorie
- IIFYM CAN BE a healthy approach to decrease weight and/or body fat

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1700 kcal
125g protein
66g fat
150g carbs
IIFYM VARIATIONS

- Chicken
- Eggs
- Beef
- Spinach
- Asparagus
- Rice
- Protein

- Egg whites
- Spinach
- Chicken
- Mixed veggies
- Sweet potatoes
- Ground turkey
- White rice
- Almonds
- Apples
- Berries
- Oats
- Peanut butter
- Protein powder

- Carbs 52%
- Fat 23%
- Protein 25%
IMPORTANCE: Many claims have been made regarding the superiority of one diet or another for inducing weight loss.

7286 individuals randomized to a popular diet (Low Carb vs Low-Fat)

Weight loss and BMI at 6 and 12 months

CONCLUSION: Significant weight loss was observed with ANY low-carbohydrate or low-fat diet. Weight loss differences between individual named diets were small.

This supports the practice of recommending any diet that a patient will adhere to in order to lose weight.

KEY POINTS:

✓ It ultimately comes down to calorie restriction
✓ Success depends on consistency/compliance
✓ Sticking to the “diet” is more important than the type of diet
✓ The RD is the best person to determine which dietary approach is most appropriate for each individual
✓ Health professionals should refer any patient/client/athlete that is seeking to improve their body composition, performance or diet to a Registered Dietitian
THE BEST DIETARY APPROACH

RESULTS = QUANTITY + QUALITY + CONSISTENCY
PERFORMANCE VS AESTHETICS: KEY DIFFERENCES

ATHLETICS/PERFORMANCE

• Goal: PERFORM
• Energy: Should meet training needs
• Primary Fuel: Carbohydrates
• Hydration: Critical
• Timing: Critical - Every 2-3 hours
• Evidence: Strong body of research
• Expert to refer: RD

AESTHETICS

• Goal: Appearance (and fitness)
• Energy: Varies
• Primary Fuel: Varies (Typically lower carb)
• Hydration: dehydration protocols may be in place to look more “cut”
• Timing: Varies – fasting is not uncommon
• Evidence: Weak body of research
• Expert to refer: RD
HOW TO BECOME A HEALTHIER (AND LEANER) YOU

THE DIETITIAN’S ADVICE

✓ GET ENOUGH SLEEP
✓ REDUCE STRESS
✓ LIMIT ALCOHOL CONSUMPTION
✓ CONSUME A CALORIE CONTROLLED, NUTRIENT-DENSE DIET
✓ COMPLIMENT THAT DIET WITH AN EFFECTIVE EXERCISE PROGRAM
✓ FIND YOUR HAPPY
If you can't see yourself doing what you’re doing now in 18 months, you probably won’t succeed.
REFERENCES

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