Energy, Sport and Recovery Drinks
Introduction

- **Energy Drinks**
  - Promoted as increasing energy and enhancing mental alertness
  - Very commonly used especially by young people

- **Sports Drinks**
  - Used during activity to rehydrate, boost energy and replenish electrolytes

- **Recovery Drinks**
  - Post workout drink to replenish nutrients and enhance recovery
Energy Drinks

- Marketed to boost mental alertness and physical stamina
- With or without sugar, may or may not be carbonated
- Up to 80% of college athletes report using them
- 61 billion dollar market by 2021
- Evidence for safety, efficacy, performance benefits unclear
  - Much of research is supported by the industry
Energy Drinks

- Vitamins
- Minerals
- Caffeine
- Water
- Carbohydrate
- Amino Acids
- Herbal mixtures
Energy Drinks-Caffeine

- FDA official caffeine limit for cola/pepper soft drinks is 71mg/12oz- Does not require companies to disclose caffeine

- 400mg of caffeine a day—generally not associated with dangerous, negative effects for healthy adults
  - That equals 4-5 (12oz cups) Maxwell house coffee
  - Starbucks blonde Roast Venti (20oz)—475mg
  - Mountain dew MDX 12oz- 71mg
Energy Drinks-Caffeine Safety concerns

- Caffeine/Herbal supplements, Who is Control?
  - Responsibility for proof lies within the manufacturer, not FDA

- Trouble sleeping, anxiety, cardiovascular events, seizures, death

- Age <18, pregnant or breastfeeding women, caffeine naïve or sensitive individuals, certain cardiovascular medical conditions, heavy consumption pattern (two or more in a session)

- Many are targeted to children, adolescents, teenagers
  - May be at youth and adult sporting events
Energy Drinks-Glucuronolactone, Taurine

- Energy drinks with both caffeine and taurine, glucuronolactone, and high vitamin concentrations
  - Redbull (8oz) 80mg –
  - Rockstar Energy (16oz) 160mg

- Glucuronolactone-few human studies
  - Said to increase alertness, energy and improve workouts

- Taurine-a conditional (opposed to essential) amino acid
  - May be helpful in cardiac disease, inflammation
  - Conflicting studies on how it affects athletic performance
Energy Drinks-Cons

- Expensive
- Often lots of calories
- Not recommended as pre, during or post exercise drinks due to often significant amounts of caffeine, herbal supplements and sugar
- Energy is carbohydrate, fat, protein
  - Some “energy” drinks only contain stimulants, vitamins, herbs and no energy at all
Sports Drinks

- 1904 Olympic Marathon on a hot, humid summer day
  - Only two water stations on the 24.85 mile long course
- In 1923 exercise physiologists became interested in how to maintain blood supple to heart and muscles during exercise
- Studied fluid consumption and carbohydrates (CHO)
Sports Drinks-Hydration

- Fluid needs are individualized
  - People can meet fluid needs throughout the day with regular food and fluid (milk, water, juice)
    - Take in consideration medical history (CHF, renal failure, elderly)
  - Athletes- water before, during, after to stay hydrated
    - Daily fluid needs can vary and can sometimes can exceed 10L/day.
    - Prevent Dehydration risk
      - >2% of body weight loss in a period
      - New research shows this might be debatable, with some “top performers” showing losses 4-6% with no problems.
Sports Drinks

- Water-if exercise < 1 hour typically water should be fine
- Gatorade/Powerade-contain sodium and carbs
  - Use if exercise is > 1 hour
  - Can add extra calories so monitor if weight loss is a goal
Sports Drinks-CHO ingestion

- **When and Why?**
  - Sports drinks increase fluid intake in athletes to stay hydrated, replace electrolytes, and maintain muscle glycogen stores.
  - >60 minutes intense exercise can start “small amounts sports drinks”
  - >2.5-3 hours need >80-90gm of carb/hour
  - Maltodextrin and fructose 1:1 is optimal mix
  - Continue to assess athletes GI tolerances
    - Alginate—Allows increase intake of carb and better water uptake without GI side effects
### Table 1: Selected Commercially Available Sports Drinks, Water, and Coke (amounts in 8 fl oz)

<table>
<thead>
<tr>
<th>Sports drink</th>
<th>Energy (kcal)</th>
<th>Sodium (mg)</th>
<th>Potassium (mg)</th>
<th>Chloride (mg)</th>
<th>Osmolality (mmol/kg)</th>
<th>Total CHO (g)</th>
<th>CHO concentration</th>
<th>Sugars (g)</th>
<th>Vitamins</th>
<th>CHO Source</th>
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</thead>
<tbody>
<tr>
<td>Accelerade</td>
<td>80</td>
<td>147</td>
<td>60</td>
<td>NS</td>
<td>280</td>
<td>14</td>
<td>7%</td>
<td>13</td>
<td>E, C</td>
<td>S, F</td>
</tr>
<tr>
<td>Gatorade</td>
<td>50</td>
<td>200</td>
<td>90</td>
<td>NS</td>
<td>349</td>
<td>14</td>
<td>6%</td>
<td>14</td>
<td>C, B3</td>
<td>S, G-F</td>
</tr>
<tr>
<td>Gatorade Endurance</td>
<td>50</td>
<td>200</td>
<td>90</td>
<td>NS</td>
<td>NS</td>
<td>14</td>
<td>6%</td>
<td>14</td>
<td>A, C</td>
<td>NS</td>
</tr>
<tr>
<td>Gatorade G2</td>
<td>20</td>
<td>100</td>
<td>30</td>
<td>NS</td>
<td>NS</td>
<td>5</td>
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</tr>
<tr>
<td>Hammer HEED</td>
<td>50</td>
<td>20</td>
<td>12</td>
<td>30</td>
<td>NS</td>
<td>13</td>
<td>1</td>
<td>B6</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>Powerade</td>
<td>50</td>
<td>100</td>
<td>25</td>
<td>NS</td>
<td>381</td>
<td>14</td>
<td>8%</td>
<td>14</td>
<td>B3, B12, B6</td>
<td>NS</td>
</tr>
<tr>
<td>Powerade Zero</td>
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<td>100</td>
<td>25</td>
<td>NS</td>
<td>NS</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>B3, B12, B6</td>
<td>0</td>
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<tr>
<td>Powerbar Ironman</td>
<td>70</td>
<td>190</td>
<td>10</td>
<td>NS</td>
<td>295</td>
<td>17</td>
<td>5%</td>
<td>10</td>
<td>NS</td>
<td>M, F, G</td>
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<tr>
<td>Perform</td>
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<td>Propel Sport Water</td>
<td>10</td>
<td>35</td>
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<td>NS</td>
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<td>3</td>
<td>NS</td>
<td>2</td>
<td>A, C, B’s</td>
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<tr>
<td>Vitamin Water</td>
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<td>NS</td>
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<td>NS</td>
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<td>C, E, B’s</td>
<td>NS</td>
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<td>Water</td>
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<td>0</td>
<td>0</td>
<td>9</td>
<td>0</td>
<td>0%</td>
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<tr>
<td>Coke</td>
<td>100</td>
<td>30</td>
<td>1</td>
<td>0</td>
<td>650</td>
<td>27</td>
<td>11%</td>
<td>27</td>
<td>S, HFCS</td>
<td></td>
</tr>
</tbody>
</table>

CHO = carbohydrate; NS = not stated; S = sucrose; F = fructose; G = glucose; M = maltodextrin; HFCS = high fructose corn syrup.
Recovery Drinks

- Refueling and Rehydrating
  - 24 hours for body to recover after stint of training
  - Low intensity training- no recovery needed
  - >90mins, multiple training sessions, competitions
    - CHO (1.0-1.5gm/kg) plus 10-20gm Protein w/adequate hydration
    - Chocolate Milk!--- 8oz = 30gm CHO, 7-8gm Protein, 160mg Na, 200ml of water, easy, cheap, delicious
      - Our favorite! Disclaimer: we don’t own stock in a chocolate milk company
Chocolate Milk

- 4:1 carbohydrate to protein ratio
  - Better at increasing glycogen stores than carbs alone
  - Less expensive than sports drinks
  - Versus sports recovery drinks: similar soreness but lower levels of CK (indicator of muscle damage)
- Drink 12-16 oz. after exercise
  - 80kg athlete might need 2 ½ cups for replacement
Tart Cherry Juice

- Touted to reduce inflammation and enhance recovery
  - Small studies
- Used for gout prevention
- Anti-oxidants in cherries—anthocyanins, flavonoids
  - Reduce exercise-induced oxidative stress
- Need to make sure you are buying 100% tart cherry juice
  - Many say 100% juice but have apple, grape or added sugar
- Can add ice to decrease tartness
- Used 12 oz twice a day for extreme exercise
Coconut Water

- Trending now
- Consider cost if you just don’t like taste of water ($1.20 per 11oz)
- Has potassium but little sodium
  - 30mg sodium versus sports drinks 100mg sodium
- Don’t use if prolonged exercise
Pickle Juice

- Sports drinks are much better choices
- Still used by some people
- Significant sodium
  - 200mg sodium in 2 ounces
Protein powder

- Frequently used
  - Smoothies (often contain other health providing items)
- Typically mixed 1 scoop (or other) in 16 oz. water
- Branched chain amino acids
- Protein, often whey
- Not recommended for rehydration
Summary

- So Many choices, What to do?
- Get back to basics- Are you eating and drinking throughout the day adequately?
- Consider your sport, taste, budget and facts.
- Educate your clients and when in doubt refer to the RD.
Questions?

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