Assessment and Selection Nutrition Overview
Pre-event considerations

- High in carbs
- Low in fat and fiber
- Moderate in protein
- Sufficient fluids
- Caffeine blood concentrations peak one hour after consumption
- Familiar
- Time to event: GI distress due to sympathetic activation
- Why?
  - Restore live glycogen from overnight fast, increase muscle glycogen, prevent hunger, maintain blood glucose levels, provide psychological boost

*1 day to day of the event
PRE EVENT

Don’t start your workout on empty!

1-4 hours before exercise

- 1 gram of carbohydrate per kg of body weight times the number of hours before the exercise
- Consume meal 2-4 hours prior to exercise
  - Choose long lasting carbs (oatmeal, fruit, veggie, whole grain bread) and fast digesting proteins (roasted chicken, egg whites, turkey, lean ham)
  - Avoid high fat foods
  - Drink 2-3 cups of water
  - Ex: Oatmeal with brown sugar and almonds + banana; turkey and cheese sandwich + fruit; lean chicken on bun + side salad + fruit and yogurt parfait

30-60 minutes before exercise

- Aim for 30 grams of fast digesting carbs, low fiber and fat
  - Ex: Fruit puree pouch such as applesauce, sports bar/gu or drink, piece of fruit, crackers or jam sandwich, nutrigrain bar
- Drink 1-2 cups of water or sports beverage (chose sports beverage if last meal was over 3 hours prior)
During event consideration

- Intrawork out carbohydrates needs increase as duration of event increases
- Type of carbohydrate matters as duration of event increases (over 3 hours)
  - Glucose + Fructose
- Low fiber and fat
- Liquid calories (sports beverage) can be a good solution to avoid GI upset
- Hydration matters! Avoid under- or over- hydration
- Avoid chugging water during high intensity training to prevent GI distress
- Caffeine is an ergogenic aid, timing and dosing matter
- Consider physical weight of the product
- Individual variability and preferences are important considerations
- If you haven’t tried it in practice, don’t try it for the first time at selection
  - e.g. practice eating/drinking fluids during events and figure out what works well for you
  - Practice eating and drinking MREs while moving as well
DURING EVENT

Carbohydrate

- **< 1 hour**: no need for additional carbohydrates

- **1-2 hours**: consider 30-60 grams of carbs (0.7g/kg of body weight) per hour, spaced every 15-20 minutes
  - Gels, granola bars, dried fruits

- **3 hours or greater**: 60-90 grams of carbs per hour
DURING EVENT - Carbohydrate (powders and gel’s)

The goal is to maintain stable blood glucose levels throughout

This is not an all-inclusive list and does not imply endorsement by the unit, unit dietitian, command, or DoD. For more information and custom planning, contact unit dietitian.
DURING EVENT - Carbohydrate (chews)

The goal is to maintain stable blood glucose levels throughout.

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3 R’s of recovery

**Replenish:** 1-1.5g of quality carbs/kg of body weight

**Repair:** 20-25g high quality lean protein

**Rehydrate:** 3 cups of fluid and electrolytes per pound of body weight lost.

Ex: 16 oz. low-fat chocolate milk, granola bar and 8 oz sports beverage, peanut butter sandwich and apple, 10 oz fruit smoothie with protein powder

Reference hotel eating handout for meal/snack ideas.
Action Plan to Combat Dehydration

- **Drink Early and Often**
  - Drink **before** you are thirsty
  - Drink at regular intervals

- **Choose Cool/Cold Beverages**
  - Athletes consume more fluids
  - Dump warm water out of camelbacks/canteens and refill with cold/cool fluids (if available)

- **Replete electrolytes**
  - Activity **>90 minutes** (steady state) / **>60 minutes** (intense/intermittent): choose beverages that **contain electrolytes and carbohydrates**

- **Eat enough FOOD**
  - Food is another source of fluid. Plus, food has electrolytes and carbohydrates which help maintain hydration
  - Ensure foods are salted
Action Plan to Combat Overhydration

• Consume **0.5 to 1 oz** per pound of body weight per day!

• **No more than 48 ounces per hour!**

• **No more than 384 ounces (12 canteens) per 24 hours period**

• Salt foods liberally, use an electrolyte replacement with fluids
Electrolytes considerations

- Heat acclimatization can decrease sodium losses from sweat
- Consumption of sodium chloride during exercise can assist with maintain hydration status
- Repletion requirements for a 3hr endurance event for sodium range from 400mg to 1g per hour
- Consider the electrolytes you are getting from food/fluid
Hydration

• Integral to performance

• Minor dehydration (1-2% of body weight) can impair performance

• Hydration for today happened yesterday, hydration for tomorrow begins today

• Monitoring of hydration status
  • Urine color: pale yellow color
  • Urine volume and frequency: every 2-4 hours
  • Sweat rate

Seek Medical Attention
MRE and Electrolytes
Energy Balance

**Energy Balance**

**Performance Impact**
- Operations in extreme environmental conditions (for example, cold, high altitude and heat), along with heavier equipment loads and terrain variances, can increase energy (kcal) needs.
- Not eating enough calories leads to weight loss, muscle wasting and decreased performance.

**Operational Ration Sources**

<table>
<thead>
<tr>
<th>Operational Ration</th>
<th>Avg kcal/meal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meal, Ready to Eat (MRE)</td>
<td>1300</td>
</tr>
<tr>
<td>Modular Operational Ration Enhancement* (MORE)</td>
<td>1000/pack</td>
</tr>
</tbody>
</table>

**Recommended Daily Intake**

<table>
<thead>
<tr>
<th>Activity Level</th>
<th>Men (kcal/d)</th>
<th>Women (kcal/d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light</td>
<td>3000</td>
<td>2100</td>
</tr>
<tr>
<td>Moderate</td>
<td>3400</td>
<td>2300</td>
</tr>
<tr>
<td>Heavy</td>
<td>3700</td>
<td>2700</td>
</tr>
<tr>
<td>Very Heavy</td>
<td>4700</td>
<td>3000</td>
</tr>
</tbody>
</table>
Carbohydrates

Carbohydrates (CHO)

Performance Impact
- During moderate to heavy exercise, CHO is the main fuel source for muscle.
- More strenuous activity levels increase CHO needs.
- Adequate amounts of CHO are needed for endurance, concentration, coordination, and recovery.

Recommended Daily Intake*
Approximately 3 grams (g)/pound of body weight (or 500 g of CHO/day for a 165 pound warfighter).

Operational Ration Examples

<table>
<thead>
<tr>
<th>CHO Range</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-19.9 g</td>
<td>Meat Entrée (beef stew, chicken stew)</td>
</tr>
<tr>
<td></td>
<td>or Jam/Jelly Packet</td>
</tr>
<tr>
<td>20-30 g</td>
<td>Cracker</td>
</tr>
<tr>
<td></td>
<td>or Side (potato au gratin, oatmeal)</td>
</tr>
<tr>
<td></td>
<td>or Pasta entrée (chili macaroni, spaghetti w/ beef &amp; sauce)</td>
</tr>
<tr>
<td></td>
<td>or Beverage (cappuccino, cocoa, electrolyte)</td>
</tr>
<tr>
<td>Greater than 30 g</td>
<td>Fruit (spiced apples, CHO enhanced applesauce, dried fruit)</td>
</tr>
<tr>
<td></td>
<td>or Bread (snack bread, tortilla, filled bakery item)</td>
</tr>
<tr>
<td></td>
<td>or Pasta entrée (elbow macaroni, cheese tortellini)</td>
</tr>
<tr>
<td></td>
<td>or Snack (cookie, pound cake, candy)</td>
</tr>
<tr>
<td></td>
<td>or Beverage (CHO fortified)</td>
</tr>
</tbody>
</table>
Protein

**Protein (PRO)**

**Performance Impact**
- Essential for proper refueling after physical activity to promote recovery.
- Secondary source of energy for the body.
- Adequate amounts needed to maintain muscle and recover from injuries.

**Recommended Daily Intake**
Approximately 0.7 g/pound of body weight (or 115 g of PRO/day for a 165 pound warfighter).

*When adequate calories are consumed, then protein recommendations are generally met through diet alone, without the need for supplementation.*

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**Operational Ration Examples**

<table>
<thead>
<tr>
<th>5-9.9 g PRO</th>
<th>Spread (peanut butter) or Meat snack</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-20 g PRO</td>
<td>Vegetarian entrée (cheese tortellini) or Snack (trail mix) or Beverage (chocolate protein drink)</td>
</tr>
<tr>
<td>Greater than 20 g PRO</td>
<td>Meat entrée (chicken chunks, tuna packet, barbecue beef)</td>
</tr>
</tbody>
</table>
Fat

Performance Impact
- During prolonged physical activity stored fat is used as energy.
- Fat helps your body absorb certain vitamins (A, D, E and K).
- Fat is the most energy dense nutrient and is essential for proper fueling.

Recommended Daily Intake*
20-35% of calories (2500 calorie intake = 56-98 g of fat)

Operational Ration Examples

<table>
<thead>
<tr>
<th>Fat Level</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-4.9 g Fat</td>
<td>Fruit (spiced apples) or Entrée (chicken chunks) or Cracker or Beverage (cappuccino, cocoa)</td>
</tr>
<tr>
<td>5-10 g Fat</td>
<td>Entrée (chicken noodle &amp; vegetable, cheese tortellini) or Bread (snack bread, tortilla, filled bakery item)</td>
</tr>
<tr>
<td>Greater than 10 g Fat</td>
<td>Snack (trail mix, cookie, pound cake) or Spread (peanut butter, cheese)</td>
</tr>
</tbody>
</table>
MRE tips and tricks

• Caution with MRE stripping
• Entrée usually contains most protein
• 12-15 grams of fiber PER meal ~45 grams/day
• First strike bars contain most micronutrients
• Beverage bases usually fortified
• Chewing gum can encourage digestion (it is not a laxative)
Event specific fueling example: 12-mile road march

- Carbohydrate intake guidelines

<table>
<thead>
<tr>
<th>2-3 hours (12 mile)</th>
<th>BEFORE</th>
<th>DURING</th>
<th>AFTER</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 g/lb 2 hr prior 0.5 g/lb 1 hr prior</td>
<td>~20-60g per hour</td>
<td>0.5 g/lb ~90g carb/30g protein</td>
</tr>
</tbody>
</table>
Fueling examples for the 12-mile road march

IF YOU WERE 180 POUNDS:

<table>
<thead>
<tr>
<th>BEFORE</th>
<th>DURING</th>
<th>AFTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>~90 grams carbs</td>
<td>~90 grams carbs, 30 g pro</td>
<td></td>
</tr>
</tbody>
</table>

- BEFORE: Gatorade, bagel, Skittles, Chips Ahoy!
- DURING: Powerade, chocolate recovery gels, GU
- AFTER: Steel cut oats with blackberries and mango, boiled eggs with peanut butter
# Event specific fueling: 12-mile road march

**20g of carb = half of MRE candy, or 1 tortilla, or raisins, or 20oz of Gatorade, or ½ bagel, or ½ cliff bar**

<table>
<thead>
<tr>
<th>Time/Distance</th>
<th>Meal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dinner</td>
<td>Well rounded meal-salt</td>
</tr>
<tr>
<td>1 hr prior</td>
<td>Bagel, 20 oz Gatorade</td>
</tr>
<tr>
<td>Mile 1</td>
<td>8 oz water</td>
</tr>
</tbody>
</table>
| Mile 2        | 8 oz water  
|               | ~15g snack |
| Mile 3        | 8 oz water |
| Mile 4        | 8 oz water |
| Mile 5        | 8 oz  
|               | ~20g snack |
| Mile 6        | 8 oz  
|               | ~20g snack |

<table>
<thead>
<tr>
<th>Time/Distance</th>
<th>Meal</th>
</tr>
</thead>
</table>
| Mile 7        | 8 oz  
|               | ~20g snack |
| Mile 8        | 8 oz  |
| Mile 9        | 8 oz  
|               | ~20g snack |
| Mile 10       | 8 oz  
|               | ~20g snack |
| Mile 11       | 8 oz  |
| Mile 12       | 8 oz  |
| Breakfast     | Meal-90g CHO, 30g pro (salt)  
|               | ~2 canteen |