Nutrition for Fractures and Bone Health

Consuming Adequate Calories:
- Maintaining adequate caloric intake in athletes is essential for bone maintenance. Restricting calories may lead to undernutrition and increase risk for stress fracture.

Consuming Adequate Protein:
- Bone collagen synthesis responds to increased amino acid levels so it is important for athletes to be eating adequate protein in order to maintain strong bones.

Athletes at higher risk for fracture:
- Amenorrheic females
- Athletes with restrictive eating patterns or diagnosed eating disorder
- Athletes with a history of bone related injuries
- Athletes with a noted diet deficiency of nutrients of concern
- Athletes with a serum vitamin D levels below optimal

Those with a history of stress fractures, frequent illness, bone and joint injury, skeletal weakness or pain, or signs of overtraining syndrome should meet with a Registered Dietitian for individualized meal planning.

<table>
<thead>
<tr>
<th>Nutrient of Concern</th>
<th>Importance to Athletes</th>
<th>Consume All of the Following to Meet Daily Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium</td>
<td>Needs increase for heavy sweaters due to increased amount of excretion</td>
<td>8 oz Milk 6 oz Yogurt 1/2 c Kale 4 oz Salmon 1 oz Cheese 1/2 c Broccoli</td>
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<tr>
<td>Vitamin D</td>
<td>Low levels may hinder athletic performance, decrease muscle strength, and increase risk for injuries</td>
<td>3 oz Salmon 8 oz Milk 1 Large egg</td>
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<tr>
<td>Vitamin K₂</td>
<td>Allows osteocalcin to draw calcium into bones in order to a strong bone matrix</td>
<td>1/2 c Collard greens 1 c Spinach 1 c Kale 1/2 c Turnip greens</td>
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<tr>
<td>Phosphorus</td>
<td>Phosphorus is used to make ATP, which is critical for energy production</td>
<td>1.5 oz Cheese 3 oz Poultry 1/4 c Almonds 1/2 c Edamame</td>
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<tr>
<td>Magnesium</td>
<td>Urinary and sweat magnesium losses may be exacerbated in heat/humidity</td>
<td>1/2 c Almonds 1/2 c Broccoli 8 oz Milk 3 Large eggs 1/2 c Bran Flakes 4 oz Lean beef 4 Large carrots 1/4 c Cashews</td>
</tr>
</tbody>
</table>

Christina Weidman RDN, LDN
Katie Knappenberger MS, RD, CSSD, ATC
Charlotte Vance MS, RD, CSCS
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