The Power of Protein

Sara Zook, RD-CD
Why is protein so important?

- Protein has been proven to be essential for appetite control, weight management, fitness/performance, and other health outcomes.
- Controlled, moderately higher protein diets can lead to greater weight loss and body fat loss, while preserving muscle mass.
- Higher protein diets have also been linked to less weight regain, as well as building muscle mass in younger individuals and preserving muscle mass in older individuals.
Assembling the Pieces

Healthy Living

Appetite

Reduced Intake

Satiation

Fat Loss

Higher Protein Diets

Weight Loss

Protein Synthesis

Lean Mass Retention

Metabolism

25-30% daily intake

1.2-1.6 g protein·kg⁻¹·d⁻¹

Key Protein-related Factors

See Review: Lettly JU et al.: AJCN 2015; Apr 29: e000538
How Much Protein?

- The AMDR for protein is 10-35% of daily calorie intake
- To estimate recommended protein intake, multiply your weight (lbs) by the number that matches your activity level or goals:

<table>
<thead>
<tr>
<th>Activity Level/Goals</th>
<th>Protein Intake (150 lb Athlete)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recreational exercise: 0.5-0.7 grams*</td>
<td>75-105 grams/day</td>
</tr>
<tr>
<td>Endurance athletes: 0.5-0.8 grams*</td>
<td>75-120 grams/day</td>
</tr>
<tr>
<td>Strength training: 0.5-0.8 grams*</td>
<td>75-120 grams/day</td>
</tr>
<tr>
<td>Weight loss/calorie restriction: 0.8-0.9 grams*</td>
<td>120-135 grams/day</td>
</tr>
</tbody>
</table>

*Per pound body weight/day
Higher-Protein Diets Boost Body Fat Loss

Subjects who consumed a weight loss diet of 30% protein lost more body fat after one year than those who consumed a diet of 15% protein.

Higher Protein Diets Improve Weight Management

Tightly-controlled higher protein diets lead to greater weight loss & fat loss, while preserving muscle, compared to standard protein diets.
**Appetite Control & Satiety**

Acute meal studies in adults providing meals as Normal Protein (NP): 13-20 g vs. High Protein (HP): 28-50 g

*Increased protein consumption beneficially modulates the hormonal signals controlling ingestive (i.e., eating) behavior*

**Ingestive (Eating) Behaviors**

*Environmental Stimuli*
A Higher Protein Meal Increases Fullness and Reduces Desire to Eat

C) Fullness

Area Under the Curve: p=0.123
Protein = Fullness

• High Protein foods control appetite and can reduce appetite for a longer period of time as compared to High Protein beverages.

• The degree of satiety that high protein foods possess is especially important when trying to restrict calories.
Assembling the Pieces

Healthy Living

Key Protein-related Factors

25-30% daily intake
1.2-1.6 g protein·kg⁻¹·d⁻¹
Timing & Pattern

• SPREAD out your protein intake – our bodies do NOT benefit from more than approximately 30 grams at one time
  • Aim for 3-4 times per day of adequate protein (approximately 20-30 grams each time).
  • There of course will be times we eat more than 30 grams of protein at a meal – but just remember that our bodies will actually utilize 30 grams or 90 grams THE SAME way.
  • Don’t go overboard with excessive amounts of protein at one time – it doesn’t pay off.
Daily protein distribution
- typical?

A skewed daily protein distribution fails to maximize potential for muscle growth

- 0.7 g/kg/day

Daily protein distribution
- Optimal

Repeated maximal stimulation of protein synthesis
→ increase/maintenance of muscle mass

- 1.3 g/kg/day

Usable Protein:
- Total Protein:
- 90 g
### Balancing Intake

<table>
<thead>
<tr>
<th>Breakfast</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Coffee with milk</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Snack</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 apple</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lunch</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2 slices whole grain bread</td>
<td></td>
</tr>
<tr>
<td>4 oz turkey breast</td>
<td></td>
</tr>
<tr>
<td>1 slice cheese</td>
<td></td>
</tr>
<tr>
<td>1 orange</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Snack</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Baby carrots</td>
<td></td>
</tr>
<tr>
<td>1 cup Greek yogurt</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dinner</th>
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</tr>
</thead>
<tbody>
<tr>
<td>6 oz chicken breast</td>
<td></td>
</tr>
<tr>
<td>1 sweet potato</td>
<td></td>
</tr>
<tr>
<td>4 oz cheese</td>
<td></td>
</tr>
<tr>
<td>mixed greens</td>
<td></td>
</tr>
<tr>
<td>1 cup skim or low fat milk</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Snack</th>
</tr>
</thead>
<tbody>
<tr>
<td>110 grams of protein</td>
</tr>
</tbody>
</table>

**Poor balance – don’t skip breakfast! This person is only utilizing about 2/3 of their protein.**
### Balancing Intake

<table>
<thead>
<tr>
<th>Breakfast</th>
<th>Snack</th>
<th>Dinner</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 hardboiled eggs</td>
<td>Baby carrots</td>
<td>4 oz chicken breast</td>
</tr>
<tr>
<td>1/2 banana</td>
<td>1 string cheese</td>
<td>1 sweet potato</td>
</tr>
<tr>
<td></td>
<td>1 cup Greek yogurt</td>
<td>mixed greens</td>
</tr>
<tr>
<td><strong>Snack</strong></td>
<td></td>
<td>1 cup skim or low fat milk</td>
</tr>
<tr>
<td>2 slices whole grain bread</td>
<td></td>
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<tr>
<td>4 oz turkey breast</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>1 orange</td>
<td></td>
<td></td>
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</tbody>
</table>

**~110 grams of protein**

Great balance! This person has evenly spread their protein intake out and will utilize all of it.
Distribution is Key

- Even out the intake throughout the day
- Example: 120 grams of protein per day =

  - Breakfast: 30 g
  - Lunch: 30 g
  - Dinner: 30 g
  - Snack: 30 g
Show me the evidence!
We have been told that breakfast is the most important meal of the day…
Now we can really understand why!

This is typically the most challenging meal to add in a protein source.
Go slow, be creative and drink plenty of water!
Breakfast Matters!

- 2 slices whole wheat toast with 2 tablespoons of PB, 1 banana, 1 cup milk
- 2 eggs with 1 oz ham or cheese wrapped in whole grain tortilla, tbsp. salsa
- Turkey and cheese sandwich on whole wheat bread
- Canadian bacon, egg and cheese bagel with 1 cup milk
- 1 cup plain Greek yogurt or cottage cheese, 1 cup fruit
- 1 cup oatmeal, 1 scoop protein powder, ½ cup berries

If you want to meet your goals, optimize breakfast with focus on quality protein.
Quality

- Choose healthy, lean sources of both animal and plant based protein
  - Animal sources of protein are considered the highest sources of quality protein
  - Plant sources of protein are limited in their amount of protein content and considered “incomplete”, however, still offer many of the benefits of protein in terms of fullness and protein synthesis.
30 grams Protein

- Small chicken breast (2½ to 3½ ounces)
- Small salmon fillet (3 to 4 ounces)
- 4 to 5 large eggs (or 6 to 8 egg whites)
- Hamburger (3 to 4½ ounces)
- ⅝ to 1 cup whole raw almonds
- ⅝ to ¾ cup dry-roasted soybeans
- 1½ to 2 cups cooked black beans or 1¾ to 1¾ cup cooked lentils
- 4 oz. tuna (two-thirds of a standard 6-ounce can)
- 1 to 1½ cups Greek yogurt

<table>
<thead>
<tr>
<th>Food</th>
<th>Amount</th>
<th>Protein in grams</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fish</td>
<td>3 oz</td>
<td>21</td>
</tr>
<tr>
<td>Chicken</td>
<td>3 oz</td>
<td>21</td>
</tr>
<tr>
<td>Turkey</td>
<td>3 oz</td>
<td>21</td>
</tr>
<tr>
<td>Meat</td>
<td>3 oz</td>
<td>21</td>
</tr>
<tr>
<td>Milk</td>
<td>8 oz</td>
<td>8</td>
</tr>
<tr>
<td>Tofu</td>
<td>3 oz</td>
<td>15</td>
</tr>
<tr>
<td>Yogurt</td>
<td>8 oz</td>
<td>8</td>
</tr>
<tr>
<td>Cheese</td>
<td>3 oz</td>
<td>21</td>
</tr>
<tr>
<td>Peanut butter</td>
<td>2 tbsp</td>
<td>8</td>
</tr>
<tr>
<td>Eggs</td>
<td>2 large</td>
<td>13</td>
</tr>
</tbody>
</table>
The biological value provides a measurement of how efficient the body utilizes protein consumed in the diet. A food with a high value correlates to a high supply of the essential amino acids. Animal sources typically possess a higher biological value than vegetable sources due to the vegetable source’s lack of one or more of the essential amino acids.
Tired of Chicken or Beef?

- Next time you make eggs or an omelet – add in some cottage cheese vs regular cheese.
  - ½ cup of cottage cheese has 15 grams of protein and < 100 calories.
- Beans – just try them! ½ cup of black beans has 7 grams protein and 6 grams of fiber – they are a great filler for most meals.
  - Add them into a mixed dish, a wrap, salads. If you have potatoes and veggies on the grill – add them into your foil packet.
- Wraps – make them your “go-to” for lunch – choose whole wheat or whole grain tortillas, English muffins, or flatbreads.
  - Use turkey pepperoni, canned chicken or tuna, egg salad, lunch meat, peanut butter to boost your protein but keep it easy.
  - Throw in some greens – add in spinach, lettuce, celery – you won’t know they are there if you still have your favorite meat combo in the wrap.
  - You can make several and store in the fridge for an easy lunch.
  - If you need a “dressing”, stick with low-fat Miracle Whip or plain Greek yogurt (is a taste match for sour cream).
- Go for white – cheese that is. White or light colored cheese – like provolone, mozzarella, ricotta, string, etc – tend to be leaner in saturated fat than “orange or yellow” cheese – like cheddar or jack. They contain the same amount of protein – but much healthier for fat.
- Remember – not all meat & dairy sources stack up for protein.
  - A hotdog only has FIVE grams of protein – along with some bad fats, while one cup of skim milk has 8 grams protein and only 80 calories.
Summary

- A diet rich in protein (1.2-1.6 g·kg⁻¹·d⁻¹) appears to be an optimal strategy to improve body weight management through increased appetite control & satiety, while reducing food cravings.

- Optimal quantities that elicit these responses: ~30 g protein/meal

- Additional factors: energy status, protein quality, food form, & timing of consumption

- Unique benefits surrounding the consumption of a protein-rich breakfast, suggesting a re-distribution of protein (from dinner)
MAXIMIZE NUTRITION

• Whole grains and high-quality carbs – 1-2 servings each meal or a serving between meals if used before exercise for energy
• High biological value protein – at least 25-30 grams each meal
• At least 5 daily servings of fruits and vegetables – for vitamins, minerals and antioxidants
• Optimal fats to help decrease inflammation
Questions?

Heather J. Leidy PhD Assistant Professor Department of Nutrition & Exercise Physiology University of Missouri, 2016
James M. Rippe, MD – Leading cardiologist, Founder and Director, Rippe Lifestyle Institute

The Power of Protein

NAME: __________________________

1. Protein is proven to be essential in:
   a. Appetite Control
   b. Weight Management
   c. Fitness/Performance
   d. All of the above
   e. None of the above

2. What factors are used to calculate recommended protein intake?
   a. Age, sex
   b. Height, age, sex
   c. Weight, activity level
   d. None of the above

3. Which are examples of lean protein (choose the best answer)?
   a. Ground beef, pork chop, hot dog
   b. Low fat milk, boneless/skinless chicken breast, tofu
   c. Egg, black beans, ribeye steak
   d. None of the above

4. True or False. “A hot dog is a good source of protein.”

5. True or False. “Breakfast is the most important meal of the day!”