What is the relationship between body composition and caloric need? [1]

Dear alice,
in attempting to preserve lean body mass, what is the relationship of body composition to caloric need: is it true that no matter how lean a person is, the same amount of calories is needed to preserve lean body mass or the leaner a person is, the more calories are needed to preserve lean body mass? which one is true? and thank you.

Answer

Dear Reader,

The amount of calories one needs to maintain weight is influenced by body composition. Your body is made up of water, protein or muscle, fat, bone, carbohydrate, vitamins, and minerals. Body composition refers to the amount of lean body mass (muscle) and fat mass in the body. Below is a chart indicating the normal percentage of body weight from specific tissues.

% Body Weight from Specific Tissues

<table>
<thead>
<tr>
<th></th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Muscle</td>
<td>45%</td>
<td>36%</td>
</tr>
<tr>
<td>Bone</td>
<td>15%</td>
<td>12%</td>
</tr>
</tbody>
</table>
Total Fat | 15% | 27%
---|---|---
Essential Fat | 3% | 12% (women need more, mainly for reproduction)
Storage Fat | 12% | 15%
Other Tissues | 25% | 25%
Total | 100% | 100%

Many factors influence body composition, including gender, age, diet, activity level, and genes. Men tend to have more muscle mass than women and women tend to have more fat mass than men. As people age, lean muscle mass decreases, making it somewhat more difficult to maintain optimal body composition. An eating plan including moderate fat can help with weight and maintenance of lean muscle mass. In addition, aerobic exercise decreases fat mass, while strength training increases lean body mass, also helping to maintain optimal body composition. Body composition also has a genetic component. Because muscle needs more calories to be sustained than fat, those who have more lean body mass have higher metabolisms, expend more calories, and need more calories to maintain muscle mass.

Body composition is measured in a number of ways:

Underwater Weighing is the most accurate method for measuring body composition. Underwater weighing involves submerging a person in a tank of water and having him/her expel the air out of his/her lungs. This method is not easy to administer and can be very expensive. The error of underwater weighing is 2 - 2.5 percent.

Skinfold Measurements measure the subcutaneous fat folds around specific body parts (triceps, waist, thigh, and back) with skin calipers. The accuracy of the skinfold test depends upon the person performing it, the integrity of the skin caliper, and the kind of formula one uses to calculate percentage of body fat. These, in turn, increase chances for error, which is 3 - 3.5 percent, but could be as high as 5 percent based on the factors mentioned.

Bioelectrical Impedence is a simple, non-invasive technique that uses electrical conductivity to estimate lean body mass. This test is dependent upon hydration status because muscle holds most of the water in the body; so, the more muscle, the better the conduction. The error of bioelectrical impedance is 3 - 3.5 percent.
Infrared Interactance uses a fiberoptic probe to measure subcutaneous fat and muscle at the biceps. The validity of this method is questionable as it is relatively new.

MRI/CT Scan creates a visual display of specific body areas, showing deep fat with the comparison to bone. This technique is expensive and has not been proven to be better than underwater weighing.

Of the body composition measurements listed, the skinfold measurement and bioelectrical impedance are the most realistic for those who are interested in finding out body composition. Many gyms have staff that know how to take skinfold measurements and/or have a bioelectrical impedance apparatus to assess body composition.

Below is a chart indicating body fat ranges for individuals:

<table>
<thead>
<tr>
<th>Body Fat</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exceptionally Lean</td>
<td>6 - 10%</td>
<td>10 - 15%</td>
</tr>
<tr>
<td>(the lower the amount, the greater the chance of amenorrhea or missed periods)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very Lean</td>
<td>11 - 14%</td>
<td>16 - 19%</td>
</tr>
<tr>
<td>Lean</td>
<td>15 - 18%</td>
<td>20 - 25%</td>
</tr>
<tr>
<td>Moderate</td>
<td>19 - 24%</td>
<td>26 - 29%</td>
</tr>
<tr>
<td>Overfat</td>
<td>25%+</td>
<td>30%+</td>
</tr>
</tbody>
</table>

Two people who are the same height and weight may need different amounts of energy or calories to maintain their weight, depending on their body composition. Also, gender, age, eating plan, activity level, and genes influence body composition, and therefore, weight maintenance caloric needs.

Alice!
Category: Nutrition & Physical Activity [2]
Miscellaneous [3]

Related questions
Body mass index (BMI) and the right weight for my height? [4]
Fat to muscle? [5]
What does body fat percentage mean? [6]
Slowing metabolism when I hit 30? [7]

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