Body Composition and Baseball Performance

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Introduction
It is no secret that today’s elite baseball players are bigger, faster, stronger, and leaner than their predecessors. In fact, it has been debated that the increased physical size and strength of the modern day player has had the most significant impact on the record-breaking performances of the past decade. Simply stated, physique plays a vital role in athletic performance, and appropriate body composition has a significant effect on baseball skill. Subsequently, players at all levels of competition should be aware of their body composition and the important role it plays in success on the field.

The purpose of this article is threefold: 1) discuss how to estimate body composition, 2) evaluate results and compare to baseball-specific norms, and 3) discuss the effect of body composition on baseball performance.

Test Your Body Composition
Many methods are available to estimate body composition including hydrostatic weighing (underwater weighing), skinfold measurements, and bioelectrical impedance. For the purpose of this article, a single-site circumference measurement will be utilized due to its simplicity and practicality. The following steps should be used to estimate body composition using the single-site circumference measurement:

Step 1: Measure your bodyweight to the nearest pound.

Step 2: Measure your waist circumference (at the umbilicus or bellybutton) to the nearest half-inch.

Step 3: Multiply your bodyweight by 1.082. Example: if you weigh 200 lb., 200 x 1.082 = 216.4.

Step 4: Determine your weight factor. Weight factor = bodyweight + 94.42. Example: 216.40 + 94.42 = 310.82

Step 5: Determine your waist factor. Waist Factor = Waist measurement x 4.150. Example: if your waist is 34”, 34 x 4.15 = 141.10

Step 6: Determine your lean body mass. Weight factor – waist factor. Example: 310.82 - 141.10 = 169.72 (169.72 would be your lean body mass).


Step 8: Determine your body fat percentage. Body fat percentage = body fat / body weight x 100. Example: 30.28 / 200 x 100 = 15.14% (your percent body fat would be 15.14%).

Compare Your Results
After calculating your percent body fat, the next logical step is to compare your results to other baseball players of similar age, position, and competition level. Use the following chart to compare your results (see Table 1):

<table>
<thead>
<tr>
<th>Position</th>
<th>High School (4)</th>
<th>College NAIA (5)</th>
<th>College NCAA DI (6)</th>
<th>Major League Baseball (2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pitchers</td>
<td>15.8%</td>
<td>14.7%</td>
<td>12.0%</td>
<td>12.3%</td>
</tr>
<tr>
<td>Catchers</td>
<td>17.5%</td>
<td>17.1%</td>
<td>17.0%</td>
<td>11.5%</td>
</tr>
<tr>
<td>Infielders</td>
<td>13.1%</td>
<td>14.9%</td>
<td>13.4%</td>
<td>9.4%</td>
</tr>
<tr>
<td>Outfielders</td>
<td>12.9%</td>
<td>10.8%</td>
<td>11.0%</td>
<td>8.4%</td>
</tr>
</tbody>
</table>

Table 1. Average Percent Body Fat for Baseball Players
Body Composition and Baseball Performance

Excess body fat provides few, if any, performance advantages for baseball players. In fact, tests of hundreds of baseball players indicate that the best performers consistently possess low percent body fat and high lean body mass\textsuperscript{2,4,5,6,7,8}. In addition, baseball players should also work to increase lean body mass (muscle mass) since research suggests that increased lean body mass enhances strength, power, agility, throwing velocity, and bat speed\textsuperscript{4,5,6,7,8}. Also, it should be noted that too little body fat can negatively influence athletic performance; a percent body fat of less than 5% is considered unsafe for male athletes\textsuperscript{2,9}.

Summary

As discussed, research suggests that appropriate percent body fat can enhance speed, power, and agility\textsuperscript{4,5,6}. In addition, increased lean body mass can significantly enhance strength, power, throwing velocity, and bat speed. Therefore, it is suggested that aspiring baseball players do the following: 1) learn to monitor percent body fat, 2) implement a sound sports nutrition program designed to control percent body fat and maximize lean body mass, and 3) employ an effective strength and conditioning program designed to improve strength, power, and baseball skill. While success in these areas will require education, discipline, and hard work, the effort can be rewarded with significantly improved baseball performance.

References


About the Author

Frank Spaniol, EdD, CSCS serves as Professor of Kinesiology at Texas A&M University-Corpus Christi. He served as the Head Baseball Coach at Morehead State University from 1989-95 and currently chairs the Executive Council of the NSCA Baseball SIG. Dr. Spaniol can be contacted at fspaniol@falcon.tamucc.edu.