

The Truth About Weighted Ball Training

By Joe Hudson, CSCS

Sports Performance Coach, DC Strength

It is no secret that pitching in Major League Baseball has become the dominant force in the game over recent years. Perhaps the largest contributor to pitching success at the highest level can be attributed to significant increases in fastball velocity. With average fastball velocity climbing from 89.5 MPH in 2002 to a staggering 92.0 MPH in 2014, it is no surprise pitchers at all levels are striving to throw harder. Young pitchers are seeking every way possible to light up the radar gun come spring, with arguably the most highly recognized method coming from weighted ball training.

Weighted baseball training has been a widely debated prescription for increasing throwing velocity since the first research on it was published in the 1960s, though it has gained greater attention in the last twenty years. As more research becomes available it becomes more evident that weighted ball training is effective when implemented correctly. As evidence supporting this training method has grown, it has created a buzz among coaches across the country. So, any coach applying high standards for development of their players must address the question:

Should I use weighted baseballs to improve throwing velocity?

Baseball is a speed-strength dominant sport, meaning the primary actions specific to the sport (throwing, hitting, sprinting) are conducted to encourage the greatest possible muscular contraction in the shortest amount of time. When it comes to training for throwing velocity improvements, it is critical to take the same approach and train in a manner that exhibits improvements in the speed-strength characteristic. Otherwise, the training may do more harm than good. In simple terms, train the throwing arm to be more explosive, not slower.

Varied resistance training has been used as a reliable method for developing the speed-strength characteristic and has resulted in the greatest velocity improvements in recent research. Varied resistance training conditions the neuromuscular system to develop a quick, explosive arm action to overcome the resistance of a baseball as fast as possible. There are two major methods researched and used for improvements in throwing velocity: Overload Training and Underload Training. To a degree, both of these training methods are forms of varied resistance training and contrast training, as they use a combination of different weighted baseballs during a training session.

Overload Training

What is it?

The term “overload” refers to a weighted baseball weighing more than the standard 5 oz. baseball. Overload training protocols have used weighted baseballs ranging from 5.25-17 oz.

What does the research show?

1. Throwing velocity improvements were shown to increase by 5-10% in College Freshman following a 10 min warm-up throwing with a 5 oz. baseball, 15 throws of gradually increasing velocity with an 11 oz. baseball, 10 throws of maximum effort with an 11 oz. baseball, finishing with 10 more throws of maximum effort with a 5 oz. baseball.

*This was a one-time study and did not examine changes over a period of time.

2. Significant increases in throwing velocity were found following a 6 week weighted ball throwing program. Players completed the throwing program 3x/week on alternating days using a 10 oz. baseball. The training protocol was completed as follows: 5 moderate effort throws (10 oz.), 20 max effort throws (10 oz.), and 20 max effort throws (5 oz.).
3. No significant differences were found following a 6 week weighted ball throwing program of increasing resistance. Similar to above, players completed a 3x/week throwing program on non-consecutive days for 6 weeks. Baseball weight was increased by 2 oz. each week from week 1 (7 oz.) through week 6 (17 oz.) completing 20 max effort throws with the appropriate weighted baseball.
4. A 12-week study completed 3x/week on non-consecutive days showed increases in throwing velocity of over 10 mph. Every two weeks baseball weight was increased by 1 oz. from a 7 oz. baseball on weeks one and two up to a 12 oz. baseball in the final two weeks. Each player completed 15 throws with the overweight baseball followed by 20 throws with a 5 oz. baseball then 10 more throws with an overweight baseball followed by another 10 throws with a 5 oz. baseball.

Underload Training

What is it?

The term “underload” refers to a weighted baseball weighing less than the standard 5 oz. baseball. Underload training protocols have used weighted baseballs ranging from 4-4.75 oz.

What does the research show?

1. Following a 10-week training protocol, pitchers noticed significant increases in pitching velocity with the underweight baseball training protocol completed 3x/week. Pitchers began the training program throwing a 5 oz. baseball during the first 2 weeks and decreased baseball weight by 0.25 oz. every 2 weeks, reaching a 4 oz. ball by weeks 9 and 10.
2. A follow-up study was completed using a 50 pitch training protocol. Pitchers completed each of the three sessions/week performing 30 pitches with a 5 oz. baseball followed by an underweight baseball of decreasing weight every 2 weeks for 20 additional pitches. Similar to the protocol above, every 2 weeks the underweight baseball decreased by 0.25 oz. so that weeks 9 and 10 were performed with a 4 oz. baseball. Significant increases in throwing velocity were found following the 10-week training protocol.
3. Another follow up study was completed using the same protocol as above, however an additional 20 pitches using a 5 oz. baseball were performed following the 20 underweight pitches. Significant increases in throwing velocity were noted again, though not as significant as in the previous study.

Which is Better?

Based on the research provided, both training methods can lead to increases in throwing velocity. So, to answer the question from above... yes, weighted ball training programs will improve throwing velocity! But, the question now becomes...

How should I use weighted ball training to improve throwing velocity?

An appropriate combination of overload and underload training may provide the greatest improvements in throwing velocity, as it not only results in arm strength, but also the neuromuscular benefits leading to improvements in arm speed. Ultimately, maximal arm speed (throwing light baseballs hard) will lead to greater velocity improvements over

maximal arm strength (throwing heavy baseballs slow). It is also important to understand the mechanical adaptations that may take place with weighted ball training, particularly in the overload phase. Heavy baseballs may cause an adverse adjustment in throwing mechanics, engendering a poor throwing pattern that causes a decrease in throwing velocity. It also may increase a pitcher's risk for injury. Establishing proper throwing mechanics should be of greatest importance before relying on more advanced methods, such as weighted ball programs.