

Single Set vs. Multiple Set Training

By Andre Noel Potvin

Date Released : 15 Apr 2000

I thought I would address a question that I seem to get asked often during my lectures on program design, which is, "Is single set training just as beneficial as multiple set training?" Ultimately, the objective of this article is to put this issue into perspective so that you, the fitness professional, are able to answer this question for your clients.

Let's answer the question right off the bat: multiple set training (3-5 sets) produces superior training results in maximum strength and hypertrophy over single set training!

So why the controversy and confusion? Well, there have been several studies that have demonstrated similar improvements in muscular strength and hypertrophy when performing single or multiple sets. However, careful examination of the research literature brings to light some intriguing explanations for these similar results.

Potential Explanations

Some studies measured strength improvements using small muscle mass type exercises or isolation type exercises such as leg curl and leg extension. It is believed that over the same period of time single joint exercises do not produce as large a training effect as multi joint exercises. This factor implies that if a study used small mass, single joint exercises, that differences between one or triple set training may have been masked and the actual impact of the three set training protocol not as evident.

Furthermore, many single set studies were generally performed in less than three months (12 weeks). It is widely accepted that as an individual trains beyond three months, gains are much more apparent and significant with multiple training.

The third explanation is many single set studies that showed similar results to multiple set training used untrained subjects. It has been well known for several decades that untrained subjects beginning any type of resistance training program initially demonstrate large performance increases over a short period of time regardless of the number of sets performed. However, as time continues (past six months), these gains (using single set training) become quite small. Trained subjects improve at a slower rate than untrained individuals and require greater stimulation in order to improve. It is here that multiple set training demonstrates its superiority.

These are only a few of many potential reasons that single set training has produced so many favorable accolades. However, this is not to say that single set training does not have its value as a viable training protocol.

Putting It Into Perspective

Sometimes a client's schedule or lifestyle does not offer him the luxury of training more than two times a week for longer than 30 minutes. Single set training is quick and produces results.

Often, clients are not willing to do a program no matter how technically perfect it is. They just don't like having to weight train for more than 20 to 30 minutes. Single set training is a simpler and more appealing option for these clients.

It does happen that some very well trained individuals are no longer capable of putting in the time or effort required to continue to stimulate gains in strength or size. This may be due to starting a new job, going back to school or having a baby. However, these people want to maintain as many of the benefits of their training for as long as possible; single set training (high intensity) has been shown to reduce strength loss as compared to no training at all. For example, one client of mine was able to perform nine chin ups with a 30 pound load in September. He then went back to his graduate studies and could only train one to two times a week for 20 to 30 minutes. After eight months of single set training once a week using the same workload, he was able to perform five chin ups with the 30 pounds. Although, he did lose strength, it was minor given the low volume and frequency of training performed during the eight months.

The bottom line is, if working with very committed TRAINED individuals wanting to improve, multiple set training appears to offer the superior training effects over time. However, if you are working with one of the following:

- Sedentary individuals
- Clients wanting muscular tone and firmness
- Clients with tight schedules
- Clients who don't like spending too much time in the gym

...then single set training may be just the thing!

The key point to remember here is not so much what is the best training protocol but rather what is the training protocol that your client is most likely capable of doing at that specific point in time! Also, take into consideration many of the variables discussed above when deciding on single versus multiple sets. So, when you are asked the question, "What's better, multiple or single set training?" You can say, "That depends!"

References:

1. Dehoyos D, Abe T, Garzarella L, HassC, Nordman M and Pollock M. Effects of 6 months of high or low volume training resistance training on muscular strength and endurance (Abstract). *Medicine and Science in Sports and Exercise*. 30(5): S165, 1998.
2. Kraemer WJ, Newton RU, Bush J, Volek J, Triplett NT, Koziris, LP. Varied multiple set resistance training produces greater gains than single set program (Abstract). *Medicine and Science in Sports and Exercise*. 27(5):S195, 1995.
3. Kraemer WJ. A series of studies: The physiological basis for strength training in American Football: Fact over philosophy. *Journal of Strength and Conditioning Research*. 11:131-142. 1997
4. Sanborn K, Boros R, Hraby, J, Schilling H, O'Bryant H, Johnson R, Hoke T, Stone M. Performance effects of weight training with multiple sets not to failure versus a single set to failure in women: A preliminary study. Presented at International Symposium on Weightlifting and Strength Training, Helsinki, Finland, Nov 1998.
5. Silvester L, Stiggins C, McGowen C and Bryce GR. The effect of variable resistance and free weight training programs on strength and vertical jump. *NSCA Journal* 3 (6): 30-33. 1982.
6. Stowers T, McMillan J, Scala D, Davis V, Wilson D and Stone M. The short-term effects of three different strength-power training methods. *NSCA Journal* 5(3): 24-27, 1983.
7. Strakey DB, Pollack ML, Ishida Y, Welsch MA, Breche WF, Graves JE, Feigenbaum MS. Effect of resistance training volume on strength and muscle thickness. *Medicine and Science in Sports and Exercise*. 28: 1311-1320. 1996
8. Westcott W. Is one set enough? *Nautilus*. 4:3, p.5-7, 1995
9. Willoughby DS. The effects of mesocycle-length weight training programs involving periodization and partially equated volumes on upper and lower body strength. *Journal of Strength and Conditioning Research* 7:2-8, 1993.

[close](#)