Efficacy of Weight Training: Multiple Sets versus Single Sets

One set of resistance training exercise is sufficient to elicit near-maximal gains in strength as long as the quality (intensity) of the set is appropriate. Studies done by Berger in the 1960s that suggested that multiple-set resistance training is more effective than training involving a single set are difficult to interpret because many training variables were manipulated at the same time. Therefore, single-set training will elicit some increase in strength in these individuals.

There are several flaws in the single-set theory. First, most beginners, as well as some advanced subjects, can’t tolerate the pain levels associated with this method. Second, these programs typically do not involve enough muscle mass or involve enough total work to achieve the hormonal responses associated with strength gains and hypertrophy. Third, many of the so-called single-set programs include warm-up sets in the beginning and brake-down sets at the end of the workout, which technically means that they are not single-set programs.

Studies appropriately designed to compare these 2 training regimens have shown that multiple-set protocols are superior for developing strength, building lean body mass, and enhancing various elements of athletic performance. Multiple-set protocols also involve higher workloads, which are necessary to stimulate the hormonal responses associated with muscular adaptation. Single-set protocols may have some value for untrained individuals in the first 8–12 weeks of a resistance-training program, but for maximal results, nothing beats a periodized, multiple-set protocol.

Gary Lavin, BSE, CSCS, NSCA-CPT
Optimum Performance Systems
Boca Raton, Florida

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Increases in strength in untrained subjects in the first 8–12 weeks of a resistance-training program are mostly due to neural recruitment. After this, the muscle begins to hypertrophy. Most of the research that claims that performing a single set to failure is as effective as multiple-set training has been done on untrained subjects within the first 8 weeks of a new program. During this phase of training, beginners will react to almost any stimulus. Therefore, single-set training will elicit some increase in strength in these individuals.

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On one hand, single-set programs are small and not meaningful for most participants. Multiple-set programs often involve several warm-up sets. While warm-up sets might be prudent for individuals lifting heavy loads with few repetitions, they are not required for most participants using an 8–12 repetition maximum range. For individuals not willing to exercise at high intensity (volitional fatigue), training volume may become more important.

James E. Graves, PhD
Professor and Chair, Exercise Science
Syracuse University
Syracuse, New York