“Super-Slow” Training: Buyer Beware

David Pearson, CSCS; and Robert Newton, CSCS

Regardless of how much research is published regarding the physiological response of the neuromuscular system to resistance training, all too often, athletes are advised to train in ways that conflict directly with fact. Several scientific facts clearly refute the efficacy of super-slow resistance training as a valuable technique in strength and conditioning.

Motor Unit Recruitment
If the goal of the resistance-training program is to increase muscle size (hypertrophy), then the most important design consideration is to recruit all of the motor units for a given muscle. Both fast- and slow-twitch muscle fibers have the capacity to increase size, and so a sensible strategy is to maximize the growth of all fibers. Slow-twitch fibers are activated in all resistance-training exercises; however, fast-twitch fibers are only activated during maximal or near-maximal lifts, as well as towards the end of a set, when fatigue of the slower motor units requires recruitment of faster motor units. According to the size principle, super-slow training will recruit predominantly slow motor units and so the hypertrophic response will not be optimal. In terms of strength, increases are achieved by a combination of hypertrophy and changes in neural activation. It has already been argued that super-slow training is unlikely to be effective for increasing muscle size. To increase the amount and frequency of neural activation, heavy resistance training at or near maximum is required. Therefore, it is unlikely that super-slow training is optimal for strength development.

Velocity Specificity
A consistent finding of research into the neuromuscular system has been the velocity specificity of training. Strength is increased at the velocity (and relative load) at which the person trains. Therefore, if strength gains are realized from super-slow training, they will only be exhibited at that slow movement speed used in training and will be greatly reduced as one performs more dynamic movements common to traditional resistance training and in particular sports and activities of daily living.

Explosive Performance
Dynamic performance, particularly in explosive or powerful movements such as jumping, throwing, or sprinting, is best improved by performing fast, powerful, resistance-training exercises. This is supported by the numerous studies showing the effectiveness of weightlifting, ballistic resistance training, and plyometrics for increasing explosive performance. The use of super-slow training is unlikely to improve athletic performance and may even reduce performance in activities requiring rapid and powerful muscle contraction. Recent research work at Southern Cross University compared super-slow and traditional resistance training. Subjects were divided into 2 groups, such that half the subjects completed normal-speed resistance training and the other half completed super-slow training. The groups were tested before and after training for arm girth measurements and for bench press and lat pull-down capacities. The traditional training group increased in all 3 measures over the training period, while the super-slow–training group did not change significantly on any of the measures. The percentage change over the training period in all 3 measures was significantly higher for the traditional training group compared with the super-slow–training group. Based on these findings it appears that super-slow training is ineffective for increasing muscle strength or size.

While it may be argued that any form of progressive overload will cause the muscle to respond to the stress, training to enhance athletic performance is much more involved. Athletes need to train for strength, power, and speed, not to become “super slow.”

Robert Newton, PhD, is the Coordinator of the Biomechanics Laboratory within the Human Performance Laboratory at Ball State University.