

about the
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If you must use static stretching in a warm-up it should be immediately followed by a sport-specific dynamic warm-up.

It is widely accepted that static stretching inhibits performance in strength and power activities. While it is clear that static stretching causes these negative affects, many coaches still employ their use as part of pre-training or competition preparations. Researchers from the Australian Institute of Sport recently examined the effects of combining static stretching with a sport-specific dynamic warm-up in order to determine if performance decrements could be prevented. Thirteen netball players performed either a submaximal run followed by 15 minutes of static stretching and a netball-specific warm-up or a dynamic stretching routine followed by an identical netball-specific warm-up as part of a pre-training/competition protocol. Performance was assessed with the use of a vertical jump test and a 20m sprint test after the dynamic or static stretching portion of the warm-up and after the netball-specific warm-up. Results indicated that the static stretching protocol resulted in a significant reduction in vertical jump performance (-4.2%) and 20m sprint time (+1.4%) when compared to the dynamic stretching protocol. However, after the netball-specific warm-up there was no difference in vertical jump heights or sprint times between the two groups regardless of if static or dynamic stretching was performed as part of the whole warm-up protocol. Based upon these findings, it was concluded that if a static stretching regime is used, it should be immediately followed by a sport-specific warm-up protocol in order to prevent any of the harmful effects associated with static stretching. While the findings of the investigation are interesting, more research is warranted to determine if this phenomenon consistently occurs.

Taylor, KL, Sheppard, JM, Lee, H, and Plummer, N. Negative effect of static stretching restored when combined with a sport specific warm-up component. *J Sci Med Sport*. 12: 657 – 661. 2009.

The effects of a neuromuscular warm-up programme on muscle power, balance, speed, and agility in female floorball players.

It is well established in the literature that the warm-up protocol utilized can have an impact on the ability to express rapid movements. Recently, researchers from Finland examined the effects of a neuromuscular warm-up protocol which included sport-specific running technique, balance, jumping, and strengthening exercises on markers of performance. The neuromuscular warm-up protocol was assessed to 119 floorball players while 103 women were placed into a control group. The intervention was performed 1 – 3 times per week and took roughly 25 minutes to complete. The effects of the protocol were assessed by measuring static and countermovement jump height, jumping over a bar, balancing on a bar, and during a "figure 8" running test. After six months, it was determined that the intervention group was able to jump over the bar a greater number of times in 15 seconds and was able to balance on a bar for a longer time period. Based upon these findings, it was concluded that integrating specific activities into the warm-up which target running technique, balance, and jumping ability can result in an enhancement in performance characteristics.

Pasanen, K, Parkkari, J, Pasanen, M and Kannus, P. Effect of a neuromuscular warm-up programme on muscle power, balance, speed and agility- A randomised controlled study. *Br J Sports Med*. 2009.

Strength and Power Parameters Predict Sprinting Performance.

It is commonly accepted that stronger athletes have an advantage in performing sprinting-based activities as a result of their enhanced ability to apply vertical forces. Because of this relationship it may be warranted to examine the ability of markers of strength and power to predict sprinting performance capacity. Recently researchers from Greece examined the strength-power performance characteristics and sprinting ability in 25 male sprinters. Subjects were tested for squat jump height, countermove-

ment jump height, drop jump height, repeated jump capacity and 100m sprint time. The 100m sprint was assessed for reaction time and speed at 10 m, 30 m, 60m and 100m. The times collected were then used to calculate mean velocities at 0 – 10 m, 10 – 30 m, 30 – 60 m, and 60 – 100 m. The reactive strength index was calculated as the difference between the countermovement and squat jump heights. It was determined that strength-power parameters and reaction time as assessed in the present study explained 89.6% of the total variance seen in sprint time. Static jump, reactive jump, drop jump, and reactive strength index performance were highly correlated with mean velocities at all points throughout the 100m sprint. Based upon these findings, it is recommended to use squat jump, countermovement jump, reactive jump, and/or drop jump heights as performance assessments in order to determine the sprinters overall effectiveness in sprinting activities.

Smirniotou, A, Katsikas, C, Paradisis, G, Argeitaki, P, Zacharogiannis, E, and Tziortzis, S. Strength-power parameters as predictors of sprinting performance. *J Sports Med Phys Fitness*. 48: 447 – 454. 2008.

Combining leucine with whey protein does not result in a greater anabolic response post exercise when compared to whey protein alone.

It is well accepted in the literature that leucine supplementation can result in an increase in muscle protein synthesis and anabolism. While it is clear that leucine is important in stimulating this response, it is less clear whether adding leucine to a whey protein supplement will result in greater anabolic effects when combined with a resistance training bout. Recently, researchers from the University of Texas Medical Branch in Galveston examined the effects of whey protein plus leucine on net protein balance in post-resistance training. Subjects performed an intense bout of resistance training which targeted the legs following the consumption of either a placebo (flavored water) or whey protein and leucine (16.6g whey + 3.4g leucine) drink. The arteriovenous amino acid balance across the leg was measured in order to determine the anabolic responses to the two treatment conditions. The arterial amino acid concentrations were significantly

higher after the consumption of the treatment beverage. These values peaked between 60 – 120 minutes post-consumption. The treatment beverage stimulated significant increases in leucine, threonine, and phenylalanine which remained elevated for 90 – 120 minutes following ingestion. Additionally, the uptake of leucine, threonine, and phenylalanine was elevated during the 5.5 hours of post-treatment consumption. When the results of this study were compared to previous investigations, it was determined that the combination of whey and leucine supplements did not result in significantly more anabolic responses than whey protein alone. Therefore, it appears that whey protein, on its own, is sufficient for inducing an increased anabolic response to resistance training. ■

Tipton, KD, Elliott, TA, Ferrando, AA, Aarsland, AA, and Wolfe, RR. Stimulation of muscle anabolism by resistance exercise and ingestion of leucine plus protein. *Appl Physiol Nutr Metab*. 34: 151 – 161. 2009.