

Effects of Arachidonic Acid Supplementation on Skeletal Muscle Mass, Strength, and Power

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ABSTRACT

Arachidonic acid (ARA) is a long-chain omega-6 polyunsaturated fatty acid that can be integrated into membrane phospholipids and it is the primary substrate for COX-2-mediated biosynthesis of prostaglandins. Previous research found that ARA could enhance power and trended to increase strength and hypertrophy. However a lack of power likely prevented these values from reaching significance. **PURPOSE:** Therefore the purpose of this study was to investigate the effects of 8 weeks of arachidonic acid (1,500 mg/day) in resistance trained individuals during a periodized resistance training program on skeletal muscle hypertrophy, body composition, strength, and power relative to a placebo matched control. **METHODS:** Thirty recreationally-trained males aged 20.4 ± 2.1 years with a respective average leg press and bench press of 231.5 ± 55.6 kg and 103.9 ± 26.8 kg, respectively, and a minimum of 1 year of resistance training experience were recruited for the study. All subjects participated in an 8-week, 3-day per week, periodized, resistance-training program that was split-focused on multi-joint movements such as leg press, bench press, and bent-over rows. Ultrasonography measured muscle thickness of the quadriceps, dual-energy X-ray absorptiometry (DEXA) determined lean body mass, power, and strength of the bench press

and leg press were determined at weeks 0, and 8 of the study. **RESULTS:** There were time, and group-by-time interactions for LBM ($p < 0.05$) in which LBM increased from pre (ARA 57.7 ± 4.8 kg; Placebo 57.6 ± 5.0 kg,) to post (ARA 59.3 ± 5.0 kg; Placebo 57.7 ± 5.0 kg,) only in ARA group, but not the placebo. Delta change of LBM was significantly greater in the ARA group (1.62 ± 0.01 kg) than the placebo (0.09 ± 0.7) ($p < 0.05$). The Delta change for muscle thickness was greater in the ARA group ($.47 \pm .08$ cm) than the placebo ($.25 \pm .04$ cm) ($p < 0.05$). There was a time, and group by time interaction for wingate power, in which power increased to a greater extent in ARA (723.01 ± 104.53 W to 800.66 ± 112.60 W) than the placebo (738.75 ± 129.76 to 766.51 ± 136.52 W). Delta change for total strength was greater in the ARA group (109.92 ± 33.25) than the placebo (75.78 ± 12.41). **CONCLUSION:** These results suggest that this ARA can positively augment adaptations in strength, and skeletal muscle hypertrophy in resistance-trained men. **PRACTICAL APPLICATIONS:** Athletes and everyday individuals looking to maximize their body composition, strength, and power could use ARA as an ergogenic aid.