

Pomegranate extract supplementation on neuromuscular performance during resistance exercise

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Dietary nitrate supplementation has been shown to improve skeletal muscle function during high-velocity and high-power contractions due to its high nitrate levels; however, there is limited data examining its potential in exercise requiring these movements, such as resistance exercise. Nitrate supplementation has been studied extensively as beetroot juice, but its poor taste severely limits its application. Pomegranate extract (POM) may be an alternative nitrate source due to its superior taste, high nitrate content, and additional antioxidants but has yet to be explored. The purpose of the present study is two-fold: 1) to determine the nitrate concentration in POM; and 2) to examine the effect of POM supplementation on neuromuscular performance during resistance exercise. In phase 1, the concentration of nitrate in commercially available pomegranate products was quantified to guide dosing regimens for phase 2. During Phase 2, in a double-blind, randomized, crossover design, 15 healthy recreationally active males and females will arrive to the laboratory for 5 visits over 3-4 weeks. Participants will perform a one repetition maximum test followed by a familiarization to the protocol. Following this, participants will perform 3 experimental conditions by consuming: 1) empty capsules containing negligible nitrate (PL); 2) a conventional dose of nitrate (POM-NORM, 9 mmol of nitrate); and 3) a high dose of nitrate (POM-HIGH, 13.5 mmol of nitrate) ~2.5 hours prior to exercise testing. During experimental visits, a resting blood draw will be obtained, then subjects will perform a protocol for determining power during countermovement jumps, kneeling countermovement pushups, and back squats. Muscle power will be determined by using a force plate and linear transducer. Results for Phase 1 of the study showed that POM extract contained 2.2 mmol of nitrate per gram of the 200 mg/mL extract. Therefore, it is recommended that participants ingest 6 capsules for 9 mmol of nitrate or 9 capsules for 13.5 mmol of nitrate. Phase 2 is in the data collection phase and ongoing.

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