

**The Effects of Chronic Creatine Supplementation on Performance and Body
Composition of Female Athletes**

by
Megan Brenner

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Approved by:

Dr. Janet Walberg Rankin, Chairman
Dr. Don Sebolt
Dr. Lawrence Cross

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ABSTRACT

The purpose of this investigation was to determine the effects of five weeks of creatine monohydrate ingestion on body composition, blood metabolite, and muscular performance measures in 16 female NCAA Division1 lacrosse players. Subjects were randomly divided into placebo (P,n=9) and creatine supplement (C,n=7) groups. The supplement group was administered 20g/d of creatine monohydrate in capsule form for 7 d and 2g/d thereafter for five weeks during which time the subjects were engaged in a pre-season conditioning program. Pre- and post-testing consisted of a three-site skinfold analysis, bioelectric impedance (BIA) measurements, hydrostatic weighing, isokinetic knee extension muscle endurance test (5 sets of 30 repetitions at 180 degrees/sec.), blood lactate response to the performance test (pre-test and 3 minutes post-test), a 1RM bench press and 1RM leg extension test. Pre-,mid-, and post- values of blood parameters (BUN and GPT) were measured in order to ensure the safety of the subjects. Data was analyzed using two-way ANOVA with repeated measures, and values are presented as mean±SEM for C and P groups, respectively. Testing revealed that 1RM bench press significantly increased in both groups (mean increase both groups: 4.5kg), and the C group improved significantly more than the P group (6.17±1.96 and 2.84± 1.84 kg). Percent body fat by skinfold also decreased significantly in both groups over time (0.52%), and the C group decreased their body fat significantly more than the P group (1.2±0.92 and +0.29±0.81%). Percent body water by BIA also decreased significantly in both groups over time (2.0%), and the C group decreased their percent body water significantly more than the P group (3.0± 1.06 and 1.0± 0.92 %). There was a trend for body fat measured by hydrostatic weighing to decrease for for both groups over the 5 weeks. Although no significant differences between groups were found in all other measures, significant time effects across groups were noted (values are absolute mean increase for both groups) for body weight (0.49±3.2kg), 1RM leg extension (1.36±4.1kg), BUN (0.07± 0.03mmol/L), total work across 5 bouts of isokinetic knee extension (283.5 ±387.3Watts), and fat-free mass by skinfold (0.70 ±1.18kg). These data indicate that a regimen of dietary creatine supplementation designed to increase total muscle Cr content significantly improved the 1RM bench press strength, and decreased the percent body fat as assessed by skinfold and the percent body water as assessed by BIA of a supplemented group more than a placebo group when all female subjects are engaged in a common resistance training program. Furthermore, chronic creatine supplementation appears to have no detrimental effect on blood metabolites which indicate kidney and liver function.

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