

## Effects of Caloric Restriction on Muscle Hypertrophy Induced by Functional Overload

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### Abstract

**Introduction:** Skeletal muscle mass loss has impact on physical activity and performance. Caloric restriction (CR) reduces muscle mass and strength by increasing muscle protein break down, while it is commonly used in sports with weight classes. In this study, we investigated whether CR affects adaptation of skeletal muscle hypertrophy induced by functional overload (FO).

**Methods:** Eight weeks of age male ICR mice were used in this study. The plantaris muscle was overloaded by synergist unilateral ablation. After 6 weeks, mice were randomly assigned to either CR or Ad libitum (AL) groups. CR mice were given 60% of the average amount of food eaten by AL mice for 2 weeks.

**Results:** CR mice were significantly lighter than AL mice. FO increased plantaris muscle in AL mice by 86%. The degree of muscle-weight increase by FO was tended to be lower in CR mice (70%). Similarly, cross sectional area was increased by FO, but there was a tendency for reduction by CR.

**Conclusions:** These results indicate that CR attenuates skeletal muscle hypertrophy induced by FO.

**Keywords:** Caloric restriction, Hypertrophy, Functional overload, Cross sectional area