

The Differential Effect of Protein Source Consumption on Muscle Mass and Performance in Obese Adults during Weight Loss Program using Low Calorie Diet and Combined Exercise

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Abstract

**Introduction:** A weight loss program is usually followed by muscle mass loss. We aimed to evaluate the differential effect of protein source consumption during weight loss program on muscle mass and performance in obese adults.

**Methods:** This was secondary data analysis of weight loss program in 45 obese male and female adults in Yogyakarta. Subjects received low-calorie diet (LCD) counselling and twice a week group exercise (aerobic and strength) for eight weeks. The dietary intake during this program was recorded using semi-quantitative food frequency questionnaire and protein source consumption was classified into 4 groups: 1)meat & poultry(MP), 2)fish & seafood(FS), 3)peas & legumes(PL), and 4)milk & egg(ME). Body weight(BW) and muscle mass(MM) were measured using body impedance analyzer, while muscle performance(MF) was measured using handgrip strength test.

**Results:** BW( $-1.54 \pm 0.41$ kg; $p=0.001$ ) decreased and MM( $0.29 \pm 0.09\%$ ; $p=0.003$ ) increased had occurred. After correction for sex and age, consumption of FS were negatively correlated with BW changes( $r=-0.455$ ; $p=0.002$ ), positively correlated with MM changes( $r=0.355$ ; $p=0.020$ ), but not correlated with changes in MF( $r=-0.148$ ; $p=0.344$ ). Consumption of MP,PL,and ME were not correlated with changes in MM and MF(all  $p>0.05$ ).

**Conclusions:** During weight loss program using combination of LCD and exercise, FS consumption is beneficial to weight loss and retain muscle mass.

**Keywords:** Protein food, Muscle mass, Muscle performance, Obese