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1: [Obes Res.](#) 2003 Jun;11(6):734-44.

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Medium-chain oil reduces fat mass and down-regulates expression of adipogenic genes in rats.

[Han J](#), [Hamilton JA](#), [Kirkland JL](#), [Corkey BE](#), [Guo W](#).

Obesity Research Center, Boston University School of Medicine, Boston, Massachusetts, USA.

OBJECTIVE: To test the hypothesis that adipose tissue could be one of the primary targets through which medium-chain fatty acids (MCFAs) exert their metabolic influence. **RESEARCH METHODS AND PROCEDURES:** Sprague-Dawley rats were fed a control high-fat diet compared with an isocaloric diet rich in medium-chain triglycerides (MCTs). We determined the effects of MCTs on body fat mass, plasma leptin and lipid levels, acyl chain composition of adipose triglycerides and phospholipids, adipose tissue lipoprotein lipase activity, and the expression of key adipogenic genes. Tissue triglyceride content was measured in heart and gastrocnemius muscle, and whole body insulin sensitivity and glucose tolerance were also measured. The effects of MCFAs on lipoprotein lipase activity and adipogenic gene expression were also assessed in vitro using cultured adipose tissue explants or 3T3-L1 adipocytes. **RESULTS:** MCT-fed animals had smaller fat pads, and they contained a considerable amount of MCFAs in both triglycerides and phospholipids. A number of key adipogenic genes were down-regulated, including peroxisome proliferator activated receptor gamma and CCAAT/enhancer binding protein alpha and their downstream metabolic target genes. We also found reduced adipose tissue lipoprotein lipase activity and improved insulin sensitivity and glucose tolerance in MCT-fed animals. Analogous effects of MCFAs on adipogenic genes were found in cultured rat adipose tissue explants and 3T3-L1 adipocytes. **DISCUSSION:** These results suggest that direct inhibitory effects of MCFAs on adiposity may play an important role in the regulation of body fat development.

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