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The effect of viscous indigestible polysaccharide on body composition and plasma hormones in rats

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Dietary interventions that reduce accumulation of body fat are of great interest. Consumption of viscous dietary fibers causes well-known positive metabolic effects, such as reductions in the postprandial glucose and insulin concentrations. However, their effect on body composition and fuel utilization has not been previously studied. To examine this, rats were fed a viscous non-fermentable dietary fiber, Hydroxypropyl Methylcellulose (HPMC), for 6 weeks. Body composition was measured by Dual-energy X-ray Absorptiometry (DXA) and fat pad weight. Plasma adipokines, AMP kinase activation and enzyme and mRNA analysis of key regulators of energetics in liver and soleus muscle were measured. The HPMC diet significantly lowered percent body fat mass and increased percent lean body mass, compared to a cellulose-containing diet (no viscosity). Fasting leptin was reduced 42% and resistin 28% in the HPMC group compared to the cellulose group. Rats fed HPMC had greater activation of AMP kinase in liver and muscle and lower Phosphoenolpyruvate Carboxykinase (PEPCK) expression in liver. mRNA expression in skeletal muscle was significantly increased for Carnitine Palmitoyltransferase 1B (CPT-1B), PPAR γ co-activator 1 α , PPAR δ and Uncoupling Protein 3 (UCP3) was Citrate Synthase (CS) activity, in the HPMC group relative to the cellulose group. These results indicated that viscous dietary fiber preserves lean body mass and reduces adiposity, possibly by increasing mitochondrial biogenesis and fatty acid oxidation in skeletal muscle and thus represents a metabolic effect of viscous fiber not previously described. Thus, viscous dietary fiber may be a useful dietary component to assist in reduction of body fat.

Biography

Ajmila Islam is an Assistant Professor of Natural Sciences at the American University in Dubai. Her PhD research was focused on the relation of diet in terms of reducing the risk of cancer. She has also worked in the area of Microbiology and Molecular Biology. She has published research in the area of colorectal cancer and obesity.

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