Interesterified palm olein (IEPalm) and interesterified stearic acid-rich fat blend (IEStear) have no adverse effects on insulin resistance: a randomized control trial

ABSTRCT

Chemically-interesterified (CIE) fats are trans-fat free and are increasingly being used as an alternative to hydrogenated oils for food manufacturing industries to optimize their products' characteristics and nutrient compositions. The metabolic effects of CIE fats on insulin activity, lipids, and adiposity in humans are not well established. We investigated the effects of CIE fats rich in palmitic (C16:0, IEPalm) and stearic (C18:0, IEStear) acids on insulin resistance, serum lipids, apolipoprotein concentrations, and adiposity, using C16:0-rich natural palm olein (NatPO) as the control. We designed a parallel, double-blind clinical trial. Three test fats were used to prepare daily snacks for consumption with a standard background diet over a period of 8 weeks by three groups of a total of 85 healthy, overweight adult volunteers. We measured the outcome variables at weeks 0, 6, and at the endpoint of 8. After 8 weeks, there was no significant difference in surrogate biomarkers of insulin resistance in any of the IE fat diets (IEPalm and IEStear) compared to the NatPO diet. The change in serum triacylglycerol concentrations was significantly lower with the IEStear diet, and the changes in serum leptin and body fat percentages were significantly lower in the NatPO-diet compared to the IEPalm diet. We conclude that diets containing C16:0 and C18:0-rich CIE fats do not affect markers of insulin resistance compared to a natural C16:0-rich fat (NatPO) diet. Higher amounts of saturated fatty acids (SFAs) and longer chain SFAs situated at the sn-1,3 position of the triacylglycerol (TAG) backbones resulted in less weight gain and lower changes in body fat percentage and leptin concentration to those observed in NatPO and IEStear.

Keyword: Interesterified fats; Palm-based margarine, Insulin resistance, Serum lipid, Clinical human feeding trial.