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Use of high oleic soybean oil to improve cardio metabolic health in at-risk adults

David Baer, Beltsville Human Nutrition Research Center, USDA-ARS, Maryland, USA

High oleic soybean oil (HOSBO) is a shelf-stable oil that provides broad versatility for both solid fat and liquid oil applications for food preparation. The impact of replacement of HOSBO for alternative solid fat and liquid oils on cardio metabolic risk factors is largely unknown. This randomized, diet-controlled, crossover trial was conducted with four treatments: 1) HOSBO, 2) soybean oil (SBO), 3) 80:20 blend of HOSBO and fully hydrogenated SBO (FHSBO), and 4) 50:50 blend of palm oil and palm olein ("palm blend") to measure cardio metabolic factors. Subjects (n=60) were randomized to a sequence of the 4 treatments and fed a controlled diet containing 50% of their total fat from the treatment. At the end of each 29-day treatment period, blood samples were collected. Concentrations of atherogenic markers [LDL cholesterol (LDLc), ApoB, Non HDL cholesterol, LDL particles] were higher after consumption of the palm blend compared to HOSBO and the other treatments (overall treatment $P<0.0001$). LDLc and ApoB were higher after consumption of the HOSBO compared to SBO ($P=0.01$, $P=0.02$, respectively). There was no significant difference in these atherogenic markers between the HOSBO+FHSBO blend and the HOSBO. Thus, replacement of up to 20% of HOSBO with FHSBO provides solid fat functionality with no change in these atherogenic markers. Consumption of the palm blend increased HDL cholesterol (HDLc) and ApoAI compared to all other treatments, with no differences among the other treatments for HDLc and ApoAI. Ratios of total cholesterol-to-LDLc and LDLc-to-HDLc were highest after consumption of the palm blend compared to the other treatments ($P<0.0001$). HOSBO, an important option for replacement of solid fat and liquid oils in multiple food applications, maintains or improves lipid and lipoprotein profiles in humans compared to alternative functional fats.