Ovariectomy does not alter the effects of *trans*-fatty acids from different sources on coronary heart disease risk factors in female Hartley guinea pigs

Beth Rice[1], J. Kraft[1], and A. L. Lock[1,2]: [1]University of Vermont, Burlington, VT 05405, [2]Michigan State University, East Lansing, MI 48824

Trans-fatty acids (TFA) in the human diet come from both, naturally- and industrially-produced sources, such as butter oil (BO) and partially hydrogenated vegetable oil (PHVO), respectively. The association between TFA consumption and coronary heart disease (CHD) risk has been demonstrated in men. In women, this association appears to be present only following menopause. The objective of the current study was to compare the effects of diets rich in TFA from either BO or PHVO on CHD risk in female guinea pigs, half of which were ovariectomized (OVX) to mimic the postmenopausal condition. Experimental diets were supplemented with 90 g/kg BO or PHVO to attain 2% energy as TFA. The amount of cholesterol in the diets was adjusted to be 0.25%. Non-OVX and OVX guinea pigs (8 per group) were assigned to the BO and PHVO dietary treatments. Plasma lipid, lipoprotein, and lipoprotein particle concentrations were determined using chemical assays and proton nuclear magnetic resonance spectroscopy, respectively. There were no differences between non-OVX and OVX guinea pigs for any of the parameters measured. The amounts of total and small high-density lipoprotein (HDL) particles in plasma were higher in guinea pigs fed BO than PHVO ($P < 0.05$). The concentration of large HDL particles, however, did not differ between the BO and PHVO treatment groups. Total cholesterol, triacylglycerides, low-density lipoprotein cholesterol, and HDL-cholesterol concentrations did not differ among guinea pigs fed BO or PHVO. These results demonstrate that regardless of ovariectomy, TFA from BO and PHVO have divergent effects on HDL particle distribution in guinea pigs.