

Table . Corn Oil: Postprandial Effects on Blood Lipids, Design Type 1 and Design Type 3 Studies

Author/ Year	De- sign Type	Class	Quality (+,-,Ø)	Purpose/ Population Sample Size	Regimen	Primary Outcome Measures Results	Author's Conclusions/ Reviewer's Comments (<i>Italicized</i>)
TYPE 1 STUDIES							
Muesing et al., 1995	RCT, CO	A	+	<p>Purpose: To compare postprandial responses of plasma lipids, in particular, HDL constituents, after administration of PUFA and more sat fat</p> <p>Sample: 12 healthy males (21-24 y of age)</p> <p>Inclusions: Healthy; within 30% of ideal body wt; normal blood chemistries; lipid/lipoprotein levels within age-dependent 95%ile limits; minimum of 20% incr in plasma TG at 2 or 4 h after consuming 50 g corn oil in test fat emulsion; eating behaviors typical of ave American</p> <p>Exclusions: Smoker; vegetarian</p>	<p>Run-in Period: 3-d food record</p> <p>TX/Duration: Emulsions of corn oil or beef tallow provided in CO fashion</p> <p>Consumed during 5-min period</p> <p>Dose/Form: 1) TX 1: 100 g corn oil 2) TX 2: 100 g beef tallow</p> <p>Test fat emulsion mixed with low fat DS dispersed in 250 ml water</p> <p>Dietary Intake During Study: Not provided</p> <p>Dietary Intake Assessment/Frequency: 3-d food records prior to 1st and 2nd study visits</p> <p>Study Visits/Measurements: Fasting blood samples</p>	<p>Outcome Measures: Lipids Apolipoproteins</p> <p>Results: Postprandial change in lipids compared with baseline values: TG: At 2 h: Corn oil: 96% ($P<0.005$) Beef tallow: 48% (NS) $P<0.005$ bet fats At 4 h: Corn oil: 96% ($P<0.05$) Beef tallow: 13% (NS) $P<0.005$ bet fats At 10 h, returned to near fasting levels after ingestion of either fat TC: At 10 h: Beef tallow: 8.1% ($P<0.005$) $P<0.005$ bet diets LDL: At 10 h: Beef tallow: 9.3% ($P=0.003$) HDL at 10 h: Total HDL: Corn oil: 5.0% Beef tallow: 7.1% $P=0.077$ bet fats</p>	<p>Author's Conclusions: "The similar postprandial increases in HDL constituents at 7-10 hours after BT and CO ingestion, despite the greater TG response with CO, suggests differences in the metabolism of chylomicrons and/or HDL due to differences in the type of fat ingested"</p> <p>Reviewer's Comments: <i>None</i></p>

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					collected at 0, 2, 4 and 10 h Washout Period: ~1 wk	Free chol: Corn oil: 6.5% (NS) Beef tallow: 10.7% ($P<0.005$) Chol ester: Corn oil: 9.0% (NS) Beef tallow: 13.1% ($P<0.005$) Phospholipid: Corn oil: 8.5% ($P<0.005$) Beef tallow: 7.5% ($P<0.005$) Apolipoprotein A-I: Corn oil: 2.1% (NS) Beef tallow: 4.9% ($P<0.05$) Lipoprotein (A-I): Corn oil: 5.9% (NS) Beef tallow: 12.1% ($P<0.005$) Apolipoprotein A-II: Corn oil: 7.5% (NS) Beef tallow: 10.9% ($P<0.005$) TC showed sig overall time-effect ($P=0.0002$) and sig diff bet effects of 2 fats over time ($P=0.0001$) Postprandial incr in HDL constituents with both fats due almost exclusively to incr in HDL ₃ fraction	
Zampelas et al., 1994	RCT, CO	A	+	Purpose: To determine effects	Run-in Period: No	Outcome Measures: TG-rich lipoproteins-TG	Author's Conclusions:

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				<p>of test meals of diff FA compositions on postprandial lipoprotein and apolipoprotein metabolism</p> <p>Sample: 12 healthy men (11 completed)</p> <p>Inclusions: University student; bet 18-49 y of age; habitual dietary fat consumption bet 35-45% of total energy; fasting TC and TG levels within normal range</p> <p>Exclusions: HX of endocrine or liver disease, hyperlipidemia or alcoholism; alcohol consumption >30 units/wk; vigorous exercise >10 h/wk; following therapeutic or specialized diet; use of DS containing FA</p>	<p>TX/Duration: Test oils incorporated into rice-based meal and consumed in evening in random order on 3 separate occasions</p> <p>Subj consumed standard breakfast, lunch and snacks</p> <p>Dose/Form: 1) Mixed oil – 40 g palm oil:coconut oil:corn oil:olive oil (2:1:0.5:1) 2) Corn oil – 40 g 3) FO – 40 g</p> <p>Dietary Intake During Study: 4-d food diary prior to 1st meal; asked to follow same dietary pattern for 4 d prior to 2nd and 3rd test meals</p> <p>Dietary Intake Assessment/Frequency: 4-d food diary prior to 1st meal</p> <p>Study Visits/Measurements:</p>	<p>TG-rich lipoproteins-cholesterol TG Cholesterol Serum lipoprotein A-I and B</p> <p>Results: Postprandial plasma-TG responses sig reduced following FO meal (365.7 ± 145.7 mmol/L x min) compared with mixed oil meal (552.0 ± 141.7 mmol/L x min) ($P < 0.05$)</p> <p>NS diff in TG bet corn oil meal and FO or mixed oil meals</p> <p>TG-rich lipoproteins-cholesterol, plasma cholesterol and serum apolipoprotein A-I and B responses to 3 meals similar</p> <p>% change not provided</p>	<p>“...this study supports the view that n-3 fatty acids reduce postprandial lipemia, since lower postprandial plasma TAG levels were observed following a meal rich in n-3 fatty acids compared with a mixed fatty acid meal (rich in SFA)...The meal rich in n-6 fatty acids had a moderate postprandial TAG-lowering effect, but was not as pronounced as the fish oil meal, and the observed differences did not reach statistical significance”</p> <p>Reviewer's Comments: <i>None</i></p>

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					Fasting blood samples collected during each study period		
Schlierf et al., 1979	RCT	A	-	<p>Purpose: To examine diurnal plasma lipids and lipoproteins following corn oil and palm oil diets</p> <p>Sample: 12 healthy men</p> <p>Inclusions: Healthy; 23-28 y of age; normal body wt; currently following normal diet (15% of energy as PRO, 37% as CHO and 48% as fat)</p> <p>Exclusions: Not provided</p>	<p>Run-in Period: 24-h diet HX to determine usual intake</p> <p>TX/Duration: Subj consumed 2 isocaloric formula diets (corn oil or palm oil) in random order; formula given in 6 equal portions at 2-h intervals</p> <p>1 d each</p> <p>Dose/Form: Not specified</p> <p>Dietary Intake During Study: Formula diet: skim milk powder, lactose and maltodextrins and palm or corn oil</p> <p>Total fat: 36-37% TE Calories: 1 kcal/mL</p> <p>Dietary Intake Assessment/Frequency: None</p>	<p>Outcome Measures: Lipids Lipoproteins Free FA Lipase activity</p> <p>Results: NS diurnal change of plasma TC and phospholipids and NS diff bet these lipid variables with 2 dietary fats</p> <p>Alimentary lipaemia characterized by approx doubling of VLDL TG (sig at 1% level), which appeared to peak bet 16 and 20 h</p> <p>Slight rise of VLDL sig for corn oil only ($P<0.05$)</p> <p>From high fasting level, free FA conc fell by more than 50% after food intake (sig at 1% level) and remained low during study</p> <p>NS diff in fasting and postprandial LPL and hepatic TG lipase, but sig ($P<0.05$) positive correlation of postprandial TG at 20 h with both lipases on palm oil</p>	<p>Author's Conclusions: "Differences in alimentary lipaemia between different fats as observed in a number of studies could not be shown in the present experiment....The finding, in our experiments, of increased LCAT activity upon ingestion of a corn oil formula but not with (saturated!) palm oil might be explained by corresponding diurnal changes in the substrate fatty acids which have, however, not been measured"</p> <p>Reviewer's Comments: <i>None</i></p>

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					Study Visits/ Measurements: Blood samples collected at 4-h intervals Washout Period: ≥1 wk	In evening, 69-80% of VLDL TG FA and as much as 29-36% of HDL TG FA of dietary origin % change and absolute change not provided	
TYPE 3 STUDY							
Tall et al., 1982	Non- ran- dom- ized trial	C	-	Purpose: To evaluate resulting changes in HDL subclasses following ingestion of fatty meal Sample: 6 subj Inclusions: Not provided Exclusions: Not provided	Run-in Period: None TX/Duration: Subj consumed 2 diff corn oil meals Dose/Form: 1) TX 1: 100 mL corn oil 2) TX 2: 80 mL corn oil + 4 eggs Dietary Intake During Study: Not provided Dietary Intake Assessment/Frequency: None Study Visits/ Measurements: Plasma HDL analyzed 4	Outcome Measures: HDL Results: 5 h after ingestion of corn oil and corn oil + eggs, maximum incr in plasma TG (99±4 mg/dL and 87±11.9, respectively, $P<0.01$) NS change in plasma chol at any time point 6 h after fat ingestion, maximum incr in apolipoprotein A-I (138±9 mg/dL from 118±5 mg/dL; $P<0.05$) and apolipoprotein A-II (51±4.3 mg/dL from 40±2.2 mg/dL; $P<0.05$) after corn oil 6 h after fat ingestion, maximum incr in apolipoprotein A-1 (146±12 mg/dL from 121±5; $P<0.05$) after corn oil + eggs	Author's Conclusions: "Our results show that after a fatty meal there are increases in concentration of phospholipids, apoA-I, apoA-11, and cholesterol in HDL. There is a major redistribution of HDL mass into subclasses of lower density, without marked alteration in the composition or size of HDL particles in individual subclasses" Reviewer's Comments: <i>None</i>

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					to 8 h after ingestion of fats	% change not provided	

APPENDIXK2CornOilPostprandialEffectsType1&3Tables