

Attention: Trans fat consultation
Health Canada
Bureau of Nutritional Sciences
Health Products and Food Branch
251 Sir Frederick Banting Driveway
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Ottawa, ON K1A 0K9

To whom it may concern,

The International Life Sciences Institute (ILSI), North American branch would like to submit written comments in response to both Health Canada's invitation to solicit comments on the PHO Consultation Document, "Toward the Prohibition of Partially Hydrogenated Oils in the Canadian Food Supply", and the agency's discussion on PHO's during the Health Canada webinar hosted on 6 December 2016.

ILSI North America recently completed work on the assessment of partially hydrogenated oils (PHOs) and the effects on LDL-C. We are pleased to share with Health Canada the research highlights and links to the three manuscripts published online in the *Journal of Food and Chemical Toxicology*.

Manuscript #1: Trans fatty acids and cholesterol levels: An evidence map of the available science

Manuscript is available online: <http://www.sciencedirect.com/science/article/pii/S0278691516302228>

At current consumption levels of industrially produced trans fatty acid (iTFA) in the U.S. population i.e. ~0.5% energy, there is limited evidence to determine the effect of iTFA on coronary heart disease (CHD) risk. Therefore, evidence mapping approaches were undertaken to identify the epidemiological data on low level iTFA intakes from partially hydrogenated oils (PHOs) and the effect on low density lipoprotein cholesterol (LDL-C). Few data points were found for iTFA at <3%en, with the majority of low-level exposures actually representing control group interventions containing non-partially hydrogenated (PHO) oils. This work identified additional studies examining low-level iTFA intake that were used to understand the relationship between PHO consumption and LDL-C levels through mode of action (MOA) and meta-regression analyses in the subsequent manuscripts.

Manuscript #2: Mode-of-action evaluation for the effect of trans fatty acids on low-density lipoprotein cholesterol

Manuscript is available online: <http://www.sciencedirect.com/science/article/pii/S0278691516301739>

The understanding of the biological effect of industrially produced trans fatty acid (iTFA) on plasma low-density lipoprotein (LDL) levels was evaluated. The findings describe the mode of action (MOA) for the effect of iTFA on LDL. It was found that elevated LDL levels result from both increased LDL production and decreased LDL clearance; both are functions of well-characterized nonlinear biological processes. Thus, adverse effects would occur only when homeostasis is disturbed (i.e., when a threshold is reached or exceeded).



Manuscript #3: **Meta-regression analysis of the effect of trans fatty acids on low-density lipoprotein cholesterol**

Manuscript is available online: <http://www.sciencedirect.com/science/article/pii/S0278691516303647>

The relationships between iTFA and LDL-C were refined by conducting a meta regression modelling. This work contributes to the previous work by investigating a range of curve shapes, including both linear and nonlinear models. The data do not support a linear dose response in the low-dose region. Instead, the best-fitting models are nonlinear S-shaped models. Best estimates predict non-adverse increases in LDL-C when total iTFA in the diet is below 2.2% energy.

ILSI North America appreciates the opportunity to share these manuscripts with Health Canada as part of the PHO Consultation.

Sincerely,

Eric Hentges, PhD
Executive Director
ILSI North America