The American Journal of Clinical Nutrition
October 2014 Media Alert

Trans fats in Canadian foods: studies show rather impressive improvements

Background In the 1970s, the scientific community began recommending lowering saturated fat intake to decrease heart disease, and the food industry responded by replacing saturated fats with partially hydrogenated vegetable oils. Unfortunately, these oils are rich in *trans* fats, which were subsequently found to be even more unhealthy than what they were replacing. Consumption of *trans* fats by breastfeeding women was also found to decrease milk fat. In response, many countries (including the United States and Canada) now require food manufacturers to include information concerning *trans* fats on food packaging and have asked for voluntary reduction of the amounts of *trans* fats added to foods. Two articles in the October 2014 issue of *The American Journal of Clinical Nutrition* report their findings concerning how these types of laws and recommendations have likely influenced *trans* fat contents of Canadian foods as well as milk produced by breastfeeding Canadian women. It is noteworthy that mandatory *trans* fat labeling of Canadian foods was implemented in 2005. These studies collectively report substantial improvements on both fronts.

Study Designs In one study, Mary L'Abbe and colleagues from the University of Toronto used a detailed, updated assessment of *trans* fat in selected Canadian packaged (grocery) and restaurant foods to determine changes in the proportion of foods meeting the recommended limits put forth by Health Canada. In the other study, *trans* fat contents of 639 human milk samples collected in 2009, 2010, and 2011 were evaluated by Nimal Ratnayake and colleagues from Health Products and Food Branch (Ottawa) and Health Canada.

Results L'Abbe and coworkers found that the proportion of foods meeting recommended limits improved from 75% in 2005–2009 to 97% in 2010–2011. Nearly all foods served in restaurants met the recommended goals. However, some categories (e.g., dairy-free "cheeses," frostings, lard/shortening, and coffee whiteners) still had large proportions exceeding the recommended limits. Ratnayake and coworkers found substantial decreases in human milk *trans* fat contents over time. Using mathematical calculations, they estimated that *trans* fat intakes of breastfeeding Canadian mothers are now well below the maximum recommended by the World Health Organization (WHO).

Conclusions Both groups of scientists concluded that Canada's national initiative to lower *trans* fat intake has succeeded. Nonetheless, improvements can still be made by the food industry to lower the *trans* fat content of some foods.

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High-protein diets during pregnancy: good, bad, or indifferent?

Background The Dietary Guidelines for Americans recommends that we consume a little less than half a gram of protein for each pound of body weight. To put this in perspective, an adult weighing 150 pounds should eat about 54 grams of protein daily—the combined amount in a hard-boiled egg, 2 cups of milk, a serving of salmon, a bowl of lentil soup, and a grilled cheese sandwich. Recommended intakes are slightly higher for pregnant women. Because some studies suggest that both low and high protein intakes during pregnancy might have long-term negative health implications, researchers continue to be interested in the optimal range of protein intake during this critical period of the lifespan. In a study published in the October 2014 issue of *The American Journal of Clinical Nutrition*, a team of Danish researchers led by Ekaterina Maslova (Centre for Fetal Programming, Statens Serum Institut, Copenhagen) report the results of a study they conducted relating protein intake during pregnancy and offspring body weight 20 years later. This article is accompanied by an editorial by Michelle Blumfield and Clare Collins (University of Newcastle, Australia) detailing the state of the science in terms of what we know, do not know, and should know about this topic.

Study Design This study began in 1988 when 915 pregnant Danish women completed a detailed dietary questionnaire from which protein intake was determined. Twenty years later, the children born to these women were asked to fill out questionnaires related to lifestyle and health. Some also provided blood samples which were analyzed for selected markers of health (e.g., cholesterol). The relation between maternal protein intake during pregnancy and the later health of each child was then evaluated.

Results Higher protein intakes (especially from animal-derived foods) during pregnancy were associated with higher risk of the offspring being overweight, especially for females. No associations between maternal protein intake and circulating biomarkers were uncovered.

Conclusions The authors concluded that, although there may be a causal relation between a woman's protein intake during pregnancy and her child's risk of obesity, these findings should be replicated and expanded prior to revising public health recommendations. Blumfield and Collins agree. After briefly reviewing both ends of the spectrum in terms of protein intake during pregnancy and later risk of obesity, they advocate that the goal of future research on this topic might be to find the "sweet spot" between the extremes.

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Threshold shift paradigm: a new and improved set-point theory?

Background Weight gain is undeniably caused by consuming more calories than one expends. Conversely, if energy consumed is less than energy expended, weight loss results. On the surface, the math underlying the energy balance equation (calories in = calories out + calories stored) seems simple. However, weight loss is typically accompanied by lower energy expenditure, which results in lower caloric requirements to maintain the newly lowered body weight. As such, to maintain weight loss, one must continue consuming fewer calories than one is used to, even after dieting is done. For this and other reasons, the majority of people who lose weight eventually gain it back. Some researchers believe that the body itself might hinder weight loss maintenance by increasing the release of hormones and neurochemicals that signal increased appetite. To help understand factors that might influence weight regain after weight loss, researchers at the University of Pisa School of Medicine (Italy) and Columbia University College of Physicians and Surgeons (New York) studied 2 groups of individuals: people who had lost weight spontaneously over 3 years (presumably by dieting) and patients who had undergone weight-loss surgery. Their results, along with an editorial by Faidon Magkos (Washington University School of Medicine, St. Louis) and colleagues, can be found in the October 2014 issue of *The American Journal of Clinical Nutrition*.

Study Design A group of 223 otherwise healthy individuals who had lost an average of 11 lb (5 kg) via dieting and a group of 182 obese individuals who had lost an average of 101 lb (46 kg) via weight-loss surgery were studied for 3 years and 1 year, respectively. Body composition and energy expenditure were estimated for each subject, and circulating leptin (a hormone that informs the brain on the status of the body's energy stores) was measured in a subset of the surgery patients.

Results Despite substantially greater weight loss in the surgery group than in the diet group, at the end of the study, body mass index (BMI) was highly correlated with initial BMI in both groups. Leptin also correlated with BMI before and after weight loss, but concentrations for any given BMI were lower after than before weight loss for those who had undergone weight-loss surgery. In other words, leptin was lower than one would predict for the new, reduced body weight in the surgery group.

Conclusions The researchers concluded that, regardless of how weight is lost (dieting or surgery), individuals who have lost weight may have physiologic responses that work to maintain body weight at higher levels than desired. The researchers hypothesize that there is a shift of the body weight threshold (or set-point) in obese individuals, so that as a person gains weight and becomes obese, a progressively greater body weight is defended. In their accompanying editorial, Magkos and colleagues discuss this theory (which they refer to as "elegant"), but remind us that "the mechanisms responsible for ultimate body weight involve a complex interaction between genetic, endocrine, neurologic, psychological, behavioral, developmental, and environmental factors."

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Caffeine intake in US kids: researchers evaluate trends over the decade

Background Caffeine, a component of commonly consumed foods and beverages, such as coffee, tea, and chocolate, has been part of the human diet for hundreds if not thousands of years. With an estimated annual consumption of nearly 120,000 tons in the United States, caffeine is considered the most popular psychoactive substance consumed around the world. Caffeine is generally believed to have no negative effects when consumed by adults in moderate amounts. Consequently, the US Food and Drug Administration (FDA) considers it safe. However, caffeine is finding its way into a variety of new foods and beverages (such as "energy" drinks and jelly beans). In response to this rapidly changing landscape of caffeine in the American diet, many health experts are curious about intake trends, especially in children who might be susceptible to potentially negative effects. A research team consisting of scientists from the US Centers for Disease Control and Prevention (CDC) and Department of Agriculture (USDA) has recently analyzed national data on caffeine intake in children. Their results are detailed in the October 2014 issue of *The American Journal of Clinical Nutrition*.

Study Design The data used in this study were obtained from the National Health and Nutrition Examination Surveys (NHANES). Dietary information obtained from 3280 children (2–19 years of age) from the NHANES 2009–10 survey was used to describe caffeine intake in relation to sociodemographic factors. Trends in caffeine intake were examined between 2001 and 2010 on the basis of dietary information from 18,530 children.

Results The majority (71%) of children reported consuming caffeine, with non-Hispanic white and Mexican American children consuming more than their non-Hispanic black counterparts.

Caffeine intake increased with age. For instance, 2- to 5-year-old caffeine users consumed 5 mg caffeine/day, whereas teens consumed 40 mg/day. To put this in perspective, a can of soda has between 24 and 50 mg caffeine. One in 10 children (6–19 years) had caffeine intakes that exceeded the Canadian maximal guidelines of 45, 63, and 85 mg/day for children ages 4–6, 7–9, and 10–12 years, respectively; for teens (≥13 years), the recommendation is that daily caffeine intake be no more than 2.5 mg/kg body weight. Whereas caffeine intake has stayed relatively constant over the past decade in teens, it has decreased in 2- to 11-year-old children.

Conclusions These up-to-date national estimates of caffeine consumption in children suggest relatively low intakes and decreasing trends over time in younger children. Future studies should hone in more on sources of caffeine and possible effects (both negative and positive) on health.

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