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Reduced or modified dietary fat for preventing cardiovascular disease: Evidence and implications for public health

Review on which this evidence summary is based:
Hooper, L., Summerbell, C.D., Thompson, R., Sills, D., Roberts, F.G., & Moore, H. (2011). **Reduced or modified dietary fat for preventing cardiovascular disease**. *Cochrane Database of Systematic Reviews*, *Issue 7*. Art. No.: CD002137. DOI: 10.1002/14651858.CD002137.pub2.

Note: The Cochrane review that this evidence summary is based on has been updated. This evidence summary summarizes the above-cited version of this review, not the updated version. An updated evidence summary will be provided as soon as possible.

Review Focus

P Adults with/without existing risk of cardiovascular disease

I Any intervention with an intention to reduce/modify dietary fat or cholesterol via dietary advice, supplementation, or a provided diet

C Usual diet, placebo, or control diet

O *Primary Outcomes:* total and cardiovascular mortality, combined cardiovascular events
Secondary Outcomes: myocardial infarction (fatal and non-fatal), stroke (fatal and non-fatal), diabetes diagnosis, cancer (deaths and diagnoses), quality of life
Tertiary Outcomes: Changes in classic cardiovascular risk factors [e.g. blood pressure, body mass index (BMI), etc.]

Review Quality Rating: 10 (strong) *Details on the methodological quality are available here.*

Considerations for Public Health Practice

Conclusions from Health Evidence	General Implications
This is a well-done review of randomized controlled trials of mostly moderate methodological quality. The findings suggest that any dietary fat intervention reduces risk of **cardiovascular events** by 14%. Based on sub-analyses of cardiovascular events: • studies of 2+ year duration were more effective • dietary fat intervention reduced cardiovascular events in men, but not in women • studies in community settings reduced events, but not those in residential institutions • baseline total fat intake and baseline cardiovascular risk did not impact events Reduced fat intake led to a slight reduction in weight and BMI, and a decrease in LDL and/or total cholesterol; while modified fat intake decreased total cholesterol. Reduction and/or modification of dietary fat did *not* impact cardiovascular mortality, stroke incidence, fatal or non-fatal MI, cancer diagnoses or deaths, diabetes diagnoses, serum triglycerides, and blood pressure.	Public health *should* promote **reduction/modification of saturated fat intake** to: • reduce cardiovascular events among men • interventions need to be implemented over 2+ years Public health *should* promote **modified fat intake** to: • decrease total cholesterol Public health *should* support **reduced fat intake** to : • reduce weight and BMI • decrease LDL and/or total cholesterol However, public health *should be aware and consider that* reduced and/or modified fat diets are not effective in reducing overall or cardiovascular mortality, stroke, fatal or non-fatal MI, cancer diagnoses or deaths, diabetes diagnoses, or improve serum triglycerides and blood pressure. No/insufficient studies assessed: the impact of modified fat diets on serum triglycerides or blood pressure; reduced vs. modified fat diets on total or cardiovascular mortality, the specific effects of **trans fats**, or the ideal type of unsaturated fat.

Evidence and Implications

What's the evidence?	Implications for practice and policy
1. Any Dietary Fat Intervention (21 RCTs) • Overall, participants were 14% less likely to have a cardiovascular event (**RR 0.86**, 95%CI 0.77 to 0.96) compared to usual diet. • *> 2 years duration*, 22% less likely (**RR 0.78, 95**%CI 0.67 to 0.92); *including dietary advice + supplementation***,** 22% less likely (**RR 0.78**, 95%CI 0.66 to 0.92); *male subjects* 18% less likely (**RR 0.82**, 95%CI 0.74 to 0.90); and, *community setting* were 16% less likely (**RR 0.84**, 95%CI 0.73 to 0.95) to have a cardiovascular event compared to usual diet. • No impact on any other outcomes.	**1. Any Dietary Fat Intervention** • Public health decision makers should promote the reduction and/or modification of dietary fat intake to reduce the risk of cardiovascular events; • This intervention is recommended primarily to improve outcomes among men, as the evidence does not support this intervention for women • community-based interventions of > 2 years duration that use dietary advice + supplementation are recommended based on the results of this review.
2. Modified Fat Diet (8 RCTs) • Decreased total cholesterol (**MD -0.44mmol/L**, 95%CI -0.60 to -0.28, -0.08mmol/L, 95%CI -0.13 to -0.03) compared to usual diet • No impact on any other outcomes.	**2. Modified Fat Diet** • Public health decision makers should only promote fat intake modification (i.e. substituting poly- and mono-unsaturated fats for saturated fats) to decrease total cholesterol.
3. Reduced Fat Diet • Decreased *weight* (**MD -0.83kg**, 95%CI -1.37 to -0.30, 16 RCTs), *BMI* (**MD -0.47kgm^{-2}**, 95%CI to -0.72 to -0.23, 10 RCTs), *LDL cholesterol* (**MD -0.10mmol/L**, 95%CI -0.14 to -0.05, 14 RCTs), and *total cholesterol* **(MD -0.10mmol/L**, 95%CI -0.14 to -0.05, 15 RCTs) compared to usual diet. • No impact on any other outcomes.	**3. Reduced Fat Diet** • Public health decision makers should promote fat intake reduction (< 30% daily energy from fat, replaced with carbohydrate) to achieve reductions in weight, BMI, LDL and/or total cholesterol. However, public health decision makers should consider whether these small reductions are clinically meaningful before implementing these interventions
4. Reduced AND Modified Fat Diet (5 RCTs) • Decreased total cholesterol (**MD -0.26mmol/L**, 95%CI -0.47 to -0.04) compared to usual diet. • No impact on any other outcomes.	**4. Reduced AND Modified Fat Diet** • Public health decision makers should only promote combined reduced + modified fat diets to achieve a slight decrease in total cholesterol.
Legend: P – Population; I – Intervention; C – Comparison group; O – Outcomes; CI – Confidence Interval; MD – Mean Difference; OR – Odds Ratio; RR – Relative Risk ***For definitions see the healthevidence.org glossary* http://www.healthevidence.org/glossary.aspx	

Why this issue is of interest to public health in Canada

Cardiovascular disease (CVD) affects roughly 1.3 million Canadians, and was the leading cause of death for Canadians in 2004.[1] CVD contributed to an estimated $22.2 billion to Canada's healthcare costs in 2000, including $7.6 billion in direct costs and $14.6 billion in indirect costs.[1] Poor diet is a key risk factor for CVD. Increased fruit and vegetable intake and decreased fat intake are recommended for preventing CVD. The recommended daily fat intake for adults is between 20% and 35% of total caloric intake, but as of 2004 20% of Canadians exceeded this recommendation, and men generally consume more calories from fat than women.[1] The majority of calories from fat consumed by adults are from the meat and alternatives category (31.6%), sandwich foods (15.9%) and baked goods (8.5%).[1] These foods contain high amounts of saturated and trans fats, which are the most damaging. Their overconsumption leads to increased levels of LDL cholesterol, obesity, and hypertension, all of which are crucial risk factors for CVD.[2]

1. Public Health Agency of Canada (2009). *Tracking heart disease & stroke in Canada*. Retrieved from http://www.phac-aspc.gc.ca/publicat/2009/cvd-avc/pdf/cvd-avs-2009-eng.pdf
2. Heart and Stroke Foundation of Canada (2010). *Prevention of risk factors*. Retrieved from http://www.heartandstroke.com/site/c.ikIQLcMWJtE/b.3483919/k.F2CA/Heart_disease__Prevention_of_Risk_Factors.htm

Other quality reviews on this topic are available on www.healthevidence.org

Suggested citation

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