

Canada Beef releases a bi-monthly Nutrition Journal Tracker as a summary report of health/nutrition research published that is of significance for beef.

**Meta-analysis** - A process that analyzes data from different studies done about the same subject. The results of a meta-analysis are usually stronger than the results of any study by itself.

**Observational study** - Observe individuals without manipulation or intervention. Associations from these studies help to formulate hypotheses to be tested in subsequent controlled experiments.

**Prospective cohort studies** - A research study that follows over time groups of individuals who are alike in many ways but differ by a certain characteristic (for example, female nurses who smoke and those who do not smoke) and compares them for a particular outcome (such as lung cancer).

**Randomized controlled trial (RTC)** - A study design that randomly assigns participants into an experimental group or a control group. RCTs seek to measure and compare the outcomes after the participants receive the interventions. The RCT is the most scientifically rigorous method of hypothesis testing available and is regarded as the gold standard trial for evaluating the effectiveness of interventions.

<b>TOPIC</b>	Saturated Fat
<b>ARTICLE</b>	Dietary Recommendations for Familial Hypercholesterolaemia: an Evidence-Free Zone
<b>CITATION</b>	David M Diamond, Abdullah A Alabdulgader, Michel de Lorgeril, Zoe Harcombe, Malcolm Kendrick, Aseem Malhotra, Blair O'Neill, Uffe Ravnskov, Sherif Sultan, Jeff S Volek. Dietary Recommendations for Familial Hypercholesterolaemia: an Evidence-Free Zone. <i>BMJ Evidence-Based Medicine</i> , 2020; bmjebm-2020-111412 DOI: 10.1136/bmjebm-2020-111412
<b>LINK</b>	<a href="https://ebm.bmj.com/content/early/2020/07/05/bmjebm-2020-111412">https://ebm.bmj.com/content/early/2020/07/05/bmjebm-2020-111412</a>
<b>SIGNIFICANCE</b>	High carbohydrate diets and insulin sensitivity make a more likely culprit of elevation of LDL cholesterol than saturated fat consumption.

## SUMMARY

- The emphasis on a low-fat diet (LFD) may result in people with hereditary high cholesterol (FH people) consuming carbohydrate-dense food, which is potentially counterproductive, in that this diet may exacerbate an insulin-resistant phenotype, also referred to as the metabolic syndrome. Metabolic syndrome, manifests as carbohydrate intolerance, is most effectively managed by a low carbohydrate diet (LCD).
- A low carbohydrate diet (LCD) has beneficial effects on well-established risk factors for coronary heart disease (CHD). Dietary guidelines should consider carbohydrate restriction as an alternative dietary strategy for the prevention/management of dyslipidemia (abnormal amount of lipids in the blood) for populations with cardiometabolic risk.
- Dietary recommendations for people diagnosed with familial hypercholesterolaemia (FH), a genetic condition in which increased low-density lipoprotein cholesterol (LDL-C) is associated with an increased risk for coronary heart disease (CHD), have emphasized a low saturated fat, low cholesterol diet to reduce their LDL-C levels.
- The basis of this recommendation is the 1939 diet-heart hypothesis, which postulates that consumption of food rich in saturated fat increases serum cholesterol levels, which increases risk of CHD. Yet there is lack of evidence that this dietary regime reduces coronary events in FH individuals. The evidence is stronger that carbohydrate consumption and insulin resistance is a more probable cause.
- Despite numerous critiques of the diet-heart hypothesis, dietary guidance for FH remains entrenched in the view that a low saturated fat, low cholesterol diet will protect FH individuals from developing CHD.

## CHD risk factors

- Lipoprotein(a) - most robust marker of CHD risk, closely associated with CHD than LDL-C.
- Interplay between clot formation (coagulation) and clots breaking apart (fibrinolysis). There's strong evidence of hypercoagulation, and not LDL-C, as a cause of CHD in FH.
- Genetics
- Smoking
- Abdominal obesity
- Hypertension - FH individuals with hypertension had more than twice the incidence of CHD than normotensive FH individuals, despite having equivalent LDL-C levels.
- High coronary artery calcium (CAC) score, which is a highly reliable marker of CHD.

## Influence of diet on heart disease risk biomarkers

- Numerous randomized controlled trials which have assessed CHD-relevant biomarker changes in response to low carbohydrate diet (LCD) versus LFD have demonstrated that the improvement in CHD biomarkers with LCD is equivalent, and in most measures superior, to biomarker modifications with an LFD. One benefit of LCD on CHD risk is in the reduction of hypertension. Two recent long-term clinical trials have shown that, over the course of 2 years, LCD resulted in significant and substantial reductions in blood pressure, as well as a reduction of hyperglycaemia and hyperinsulinaemia.
- Historically, lipoprotein(a) has been viewed as a genetically determined marker of CHD risk which is unaffected by diet. However, this perspective was based solely on studies conducted on individuals on an LFD, which does not affect lipoprotein(a) or even increases lipoprotein(a). LCD, by contrast, is the only dietary approach which has been shown to significantly reduce lipoprotein(a) levels, an effect which may reduce the risk of CHD in FH.

- The basis of the diet-heart hypothesis was that consumption of food rich in saturated fat would increase risk for CHD. But in a RCT, subjects in the LCD group exhibited superior improvements in CHD risk factors than the LFD group, despite the LCD group having consumed more than three times as much saturated fat as the LFD group.
- Studying the effects of a moderately LCD (30%), high fat (55%) diet, supplemented with up to 1800 mg/day of cholesterol (from eggs), on serum lipids in FH subjects found that consumption of additional fat and cholesterol in the context of an LCD lowered TGs and raised HDL, and did not affect LDL-C levels in FH individuals. This study demonstrated that FH individuals responded to the low carbohydrate, high fat, high cholesterol diet in an equivalent manner to non-FH individuals.