Letter on Corpulence: One Actuary's Attempt at Carbocide & an Underwriter's View

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“… about 5 feet 5 inches in stature, and, in August last, weighed 202 lbs … I now weigh 167 lbs, showing a diminution of something like 1 lb, per week since August, …”
Nutritional Advice Today
General Wisdom – Last 50 Years

- Saturated Fats (butter, lard, milk, red meat, coconut oil)
- Cholesterol (eggs, poultry, beef, etc.)
- Polyunsaturated Fats (soybean, sunflower, corn, cottonseed oils)
- Carbohydrates (pasta, bread, sugar etc.)

Source: fotolia.com
Eatwell Guide

Use the Eatwell Guide to help you get a balance of healthier and more sustainable food. It shows how much of what you eat overall should come from each food group.

Choose wholegrain or higher fibre versions with less added fat, salt and sugar

Choose unsaturated oils and use in small amounts

Eat more beans and pulses, fish, eggs, meat and other proteins. 1 or 2 portions of sustainably farmed and processed meat.

Eat 5 portions of a variety of fruit and vegetables every day

Eat as little processed or deep-fried foods as possible

Eat less often and in small amounts

Source: Public Health England in association with the Welsh Government, Food Standards Scotland and the Food Standards Agency in Northern Ireland

12 March 2018
“Saturated and trans fats can increase the amount of cholesterol in your blood. Too much cholesterol can have a serious effect on your health as it increases your risk of having a heart attack or stroke.”

Source: Public Health England in association with the Welsh Government, Food Standards Scotland and the Food Standards Agency in Northern Ireland
Follow a healthy eating pattern over time to help support a healthy body weight and reduce the risk of chronic disease.

A Healthy Eating Pattern Includes:

- Fruits
- Vegetables
- Protein
- Dairy
- Grains
- Oils

A Healthy Eating Pattern Limits:

- Saturated Fats & Trans Fats
- Added Sugars
- Sodium

“Consume less than 10 percent of calories per day from saturated fats”

Source: Dietary Guidelines for Americans 2015-2020
Why we think Saturated Fat is Unhealthy
1950s – Americans found themselves to be in a terrible epidemic – heart disease

Source: https://doi.org/10.1161/01.CIR.102.25.3137 Circulation. 2000;102:3137-3147

* Rates are age-adjusted to 2000 standard
Cholesterol

Vital component of every cell membrane, controlling what goes in and out of the cell.

Responsible for the metabolism of sex hormones and is found at its highest concentration in the brain.
Cholesterol

Vital component of every cell membrane, controlling what goes in and out of the cell.

Responsible for the metabolism of sex hormones and is found at its highest concentration in the brain.

A primary component of atherosclerotic plaques.

A main culprit in the development of coronary disease?
Diet Heart Hypothesis

Source: fotolia.com
Ancel Benjamin Keys, a physiologist at the University of Minnesota

Inventor of K-Rations and the man who revolutionized the study of heart disease

Synonymous with the Diet Heart Hypothesis and the 7 countries study
Keys’s 1952 Chart: Fat Calories vs. Deaths from Degenerative Heart Disease

Diet Heart Hypothesis

↑ Saturated Fat → ↑ Serum Cholesterol → ↑ Cardiovascular Disease
Diet Heart Hypothesis

\[ \Delta \text{Serum Cholesterol (mmol/l)} = 0.031(2D_{sf} - D_{puf}) + 1.5\sqrt{D_{ch}} \]

↑ Saturated Fat ➔ ↑ Serum Cholesterol ➔ ↑ Cardiovascular Disease
View of the Insurance Industry
Medical Underwriting

Cholesterol “Normal” Limits

- Total Cholesterol @ <5 mmol/L (<4)
- LDL – C @ <3 mmol/L (<2)
- HDL – C @ >1mmol/L
- Triglycerides @ <1.7mmol/L
The Framingham Study

High total cholesterol was a reliable predictor for heart disease.

Solved a problem that had plagued heart disease research from the start, namely, that investigators needed something they could measure to assess heart attack risk before death.

“blood cholesterol is somehow intimately related to coronary atherosclerosis is no longer subject to reasonable doubt.”
More Complex
Fat

Mono-unsaturated Fats

Poly-unsaturated Omega-3

Poly-unsaturated Omega-6

Saturated Fats

Trans Fats

Source: fotolia.com
Fat

- Mono-unsaturated Fats
- Poly-unsaturated Omega-3
- Saturated Fats
- Poly-unsaturated Omega-6
- Trans Fats

Source: fotolia.com
Cholesterol

High Density Lipoproteins (HDL – C)

High concentrations of blood cholesterol causes CVD and Dietary saturated fats cause the raised concentrations of blood cholesterol

Low Density Lipoproteins (LDL – C)

Source: fotolia.com
**Cholesterol**

Source: https://www.medicalnewstoday.com/articles/318712.php

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Insulin Resistance (IR)

Is a pathological condition in which cells fail to respond normally to the hormone insulin.

When the body produces insulin under conditions of insulin resistance, the cells are resistant to the insulin and are unable to use it as effectively, leading to high blood sugar.

“INSULIN RESISTANCE SYNDROME”

Source: fotolia.com
Latest Research
2009 – 137,000 adults with heart attacks – 75% had low LDL

2016 – *British Medical Journal* – inverse relationship between high LDL and mortality

2017 – *Evidence Based Medicine*, patients with CAD reduced LDL by 37%, with no reduction in mortality

*Fourier* study – reducing LDL by 60% did not increase life span
The Framingham Study – follow up

Predictive power of total cholesterol was not nearly as strong as study leaders had originally thought.

Data also failed to show that lowering one’s cholesterol over time was even remotely helpful.

Cholesterol sub-fractions, which could now be measured and whose predictive powers showed more promise.

“In Framingham, Mass, the more saturated fat one ate . . . the lower the person’s serum cholesterol . . . and [they] weighed the least,”
Minnesota Coronary Experiment

**Double blind RCT** to test whether replacement of saturated fat with vegetable oil rich in linoleic acid reduces coronary heart disease and death

Trial ran from 1968-1973, but unpublished documents and raw data were recovered in 2016

Minnesota Coronary Experiment

“Though the MCE intervention lowered serum cholesterol, this did not translate to improved survival”

“Paradoxically, MCE participants who had greater reductions in serum cholesterol had a higher, rather than lower, risk of death”

Pure Study – Nov 2017

Large epidemiological cohort study of individuals aged 35-70 years over 18 countries

Dietary intake of 135,335 individuals recorded using validated food frequency questionnaires

Assessed associations between consumption of carbohydrate, total fat, and each type of fat with cardiovascular disease and total mortality

Source: The Lancet - Volume 390, No. 10107, p2050–2062, 4 November 2017
“… a high carbohydrate intake was associated with an adverse impact on total mortality, whereas fats including saturated and unsaturated fatty acids were associated with lower risk of total mortality and stroke.”

“We did not observe any detrimental effect of fat intakes on cardiovascular disease events”

“Global dietary guidelines should be reconsidered …”
What should the industry be doing?

- Watch this space…..
- Educate the consumer and……
- Medically assess applicants differently
- New products
Personal Carbocide

Low Fat Guidelines Introduced

NOTES: Age-adjusted by the direct method to the year 2000 U.S. Census Bureau estimates using age groups 20–39, 40–59, and 60–74. Overweight is body mass index (BMI) of 25 kg/m² or greater but less than 30 kg/m²; obesity is BMI greater than or equal to 30; and extreme obesity is BMI greater than or equal to 40. Pregnant females were excluded from the analysis.

SOURCES: NCHS, National Health Examination Survey and National Health and Nutrition Examination Surveys.

Number and Percentage of U.S. Population with Diagnosed Diabetes, 1958-2015

Source: http://www.cdc.gov/diabetes/data
### Banting

<table>
<thead>
<tr>
<th>Animal protein</th>
<th>Dairy</th>
<th>Fats</th>
<th>Nuts and seeds</th>
<th>Vegetables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eggs</td>
<td>Cottage cheese</td>
<td>Olive oil</td>
<td>Almonds</td>
<td>All green leafy vegetables, cruciferous vegetables or above ground vegetables</td>
</tr>
<tr>
<td>Meats</td>
<td>Cream</td>
<td>Avocados</td>
<td>Flaxseeds</td>
<td></td>
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<tr>
<td>Poultry</td>
<td>Full-cream</td>
<td>Coconut oil</td>
<td>Macadamia</td>
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<tr>
<td>Game</td>
<td>Greek Yogurt</td>
<td>Macadamia nut oil</td>
<td>Pecan</td>
<td></td>
</tr>
<tr>
<td>Seafood</td>
<td>Cheeses</td>
<td></td>
<td>Pine nuts</td>
<td></td>
</tr>
</tbody>
</table>

Before and After

May 2011

Dec 2015

Source: PartnerRe
Measures

- Energy
- HDL
- Satiety
- Clothing Budget

- Triglycerides
- LDL
- Blood Glucose
- TG / HDL

- Weight
- BMI
- Migraines

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Diabetes Treatment

Dr. David Unwin – Norwood Surgery Southport

Pilot study exploring the results of a low carbohydrate diet of 19 type 2 diabetics over an 8 month period

Blood Glucose
Weight

Waist Circumference
Total Serum Cholesterol

Source: Practical Diabetes 2014; 31(2): 76–79

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“… I’m afraid the claims about saturated fat made in this opinion piece are unhelpful and misleading.

Decades of research have **proved** that a **diet rich in saturated fat** increases ‘bad’ LDL cholesterol in your blood, which **puts you at greater risk of a heart attack or stroke**.”

The diet heart hypothesis has never been proved
Final Thoughts

The diet heart hypothesis has never been proved

- Saturated fats may increase LDL
- Saturated fats raise HDL

Source: fotolia.com
Final Thoughts

The diet heart hypothesis has never been proved

Saturated fats may increase LDL
Saturated fats raise HDL

No such thing as “good” and “bad” cholesterol.

Size of LDL particles matters
Small dense LDL particles associated with greater risk

Source: fotolia.com
Final Thoughts

The diet heart hypothesis has never been proved

- Saturated fats may increase LDL
- Saturated fats raise HDL
- Shifts LDL-C from small, dense to large LDL

No such thing as “good” and “bad” cholesterol.

- Size of LDL particles matters
- Small dense LDL particles associated with greater risk

Source: fotolia.com
Homonyms are problematic:

“\textit{The important thing is not to stop questioning. Curiosity has its own reason for existing}”

Albert Einstein
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Terminology

**EPI**

Epidemiological / Observation Studies

A group of subjects is profiled and investigators watch them over a period of time. Outcomes are then correlated to the variables originally measured. These studies can demonstrate **associations** but **not causations**.

**RCT**

Randomized Control Trial

A study in which the participants are assigned by chance to separate groups; neither the researchers nor the participants can choose which group. The **gold standard** for establishing causal conclusions. Ideally conducted they ensure that the treatment ‘causes’ the outcome in the experiment.
Mortality from Arteriosclerotic and Degenerative Heart Disease and Percent of Total Calories from Fat – Males age 55–59, 1950

Country
1. Australia
2. Austria
3. Canada
4. Ceylon
5. Chile
6. Denmark
7. Finland
8. France
10. Ireland
11. Israel
12. Italy
13. Japan
14. Mexico
15. Netherlands
16. New Zealand
17. Norway
18. Portugal
19. Sweden
20. Switzerland
21. United Kingdom
22. United States

Fat Calories as % of Total Calories

“… suggested association between national death rates from heart disease and percentage of fat in the diet available for consumption cannot at the present time be accepted as valid.”