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FULLY BOOKED
(Room 11)

Saturday, June 10, 2017

8:30 - 9:25 WS #89: The Latest Science on the Links Between Diet, Heart Disease and Diabetes

9:35 - 10:30 WS #101: The Latest Science on the Links Between Diet, Heart Disease and Diabetes
(Repeated)

The Latest Science on the Links Between Diet, Heart Disease and Diabetes

Professor David Cameron-Smith
University of Auckland

CARDIOVASCULAR
DISEASE AFFECTS

1 IN **3**

Conflicts of Interest

Present

- A2Milk Company
- Dairy Goat Cooperative
- Fonterra
- Nestle
- Yashili Dairy
- AgResearch, MBIE, National Science Challenge (High-Value Nutrition), MPI, HRC.

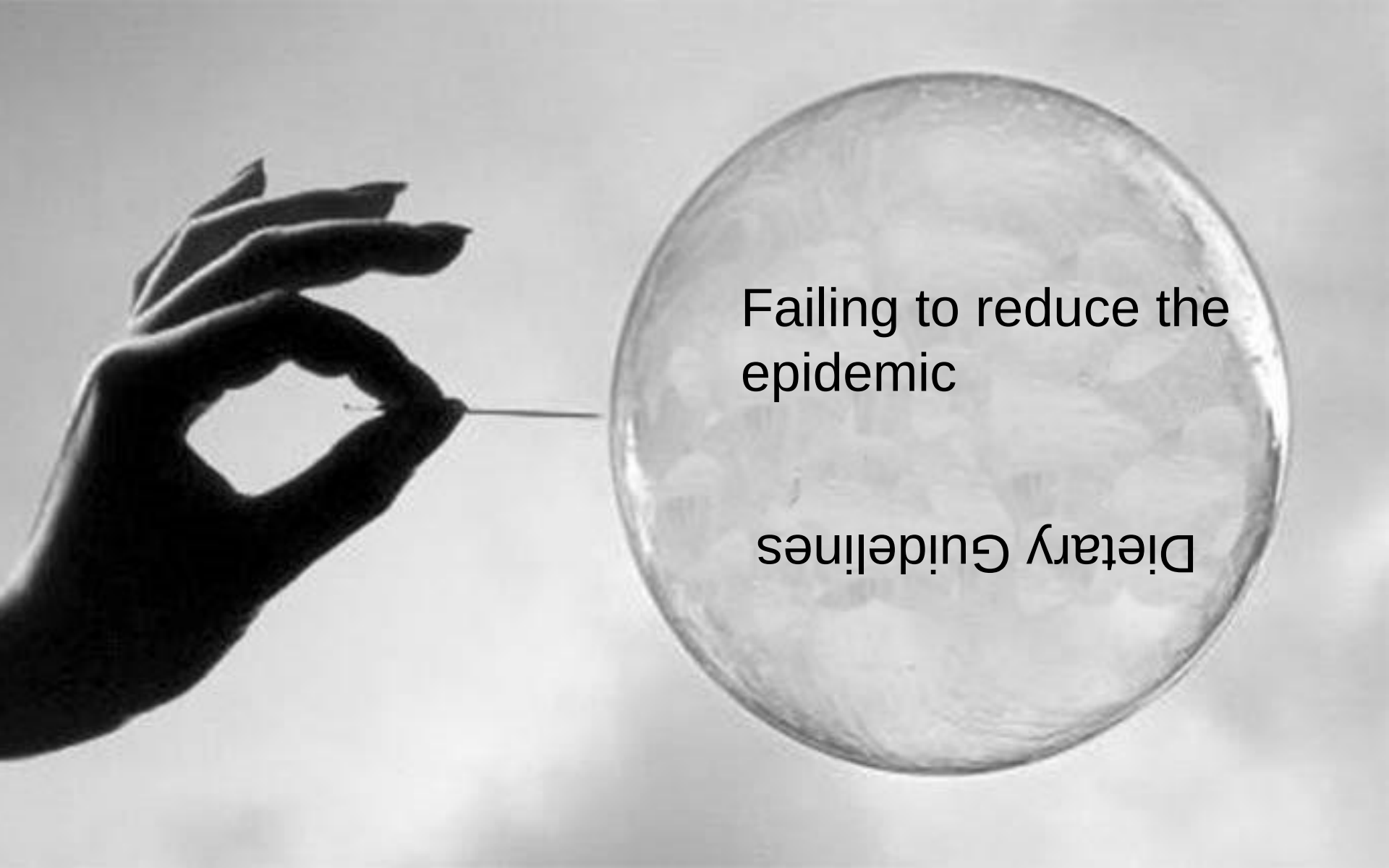
Past

- Murray Goulburn Cooperative (Australia)
- Dairy Australia
- Meat & Livestock Australia
- Palm Oil Board of Malaysia
- NHMRC, ARC

AHEAD

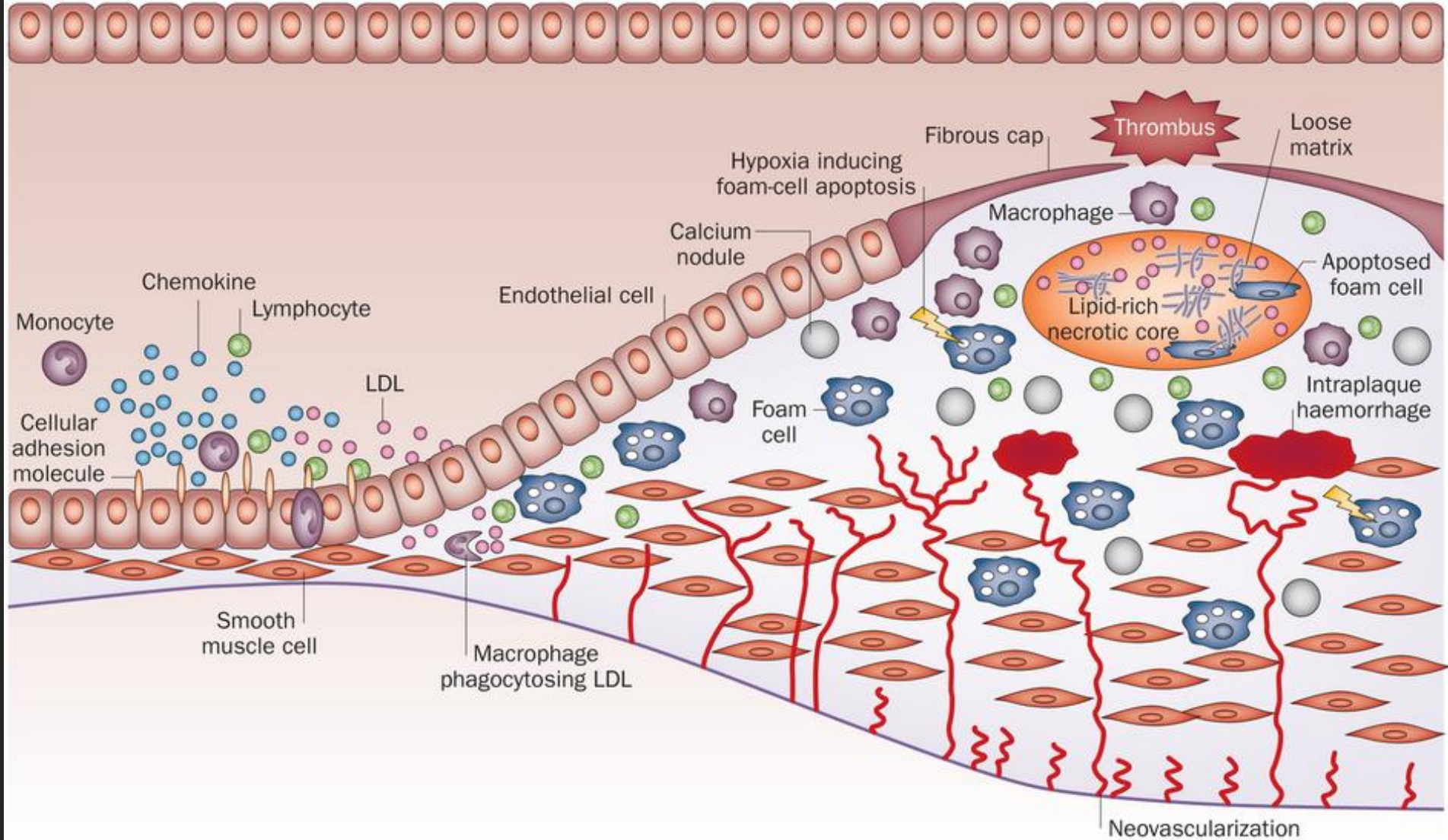
1. CVD is complex.
2. Saturated fat – yes/no.
3. More – much more on Fat.
4. Carbs
5. Other



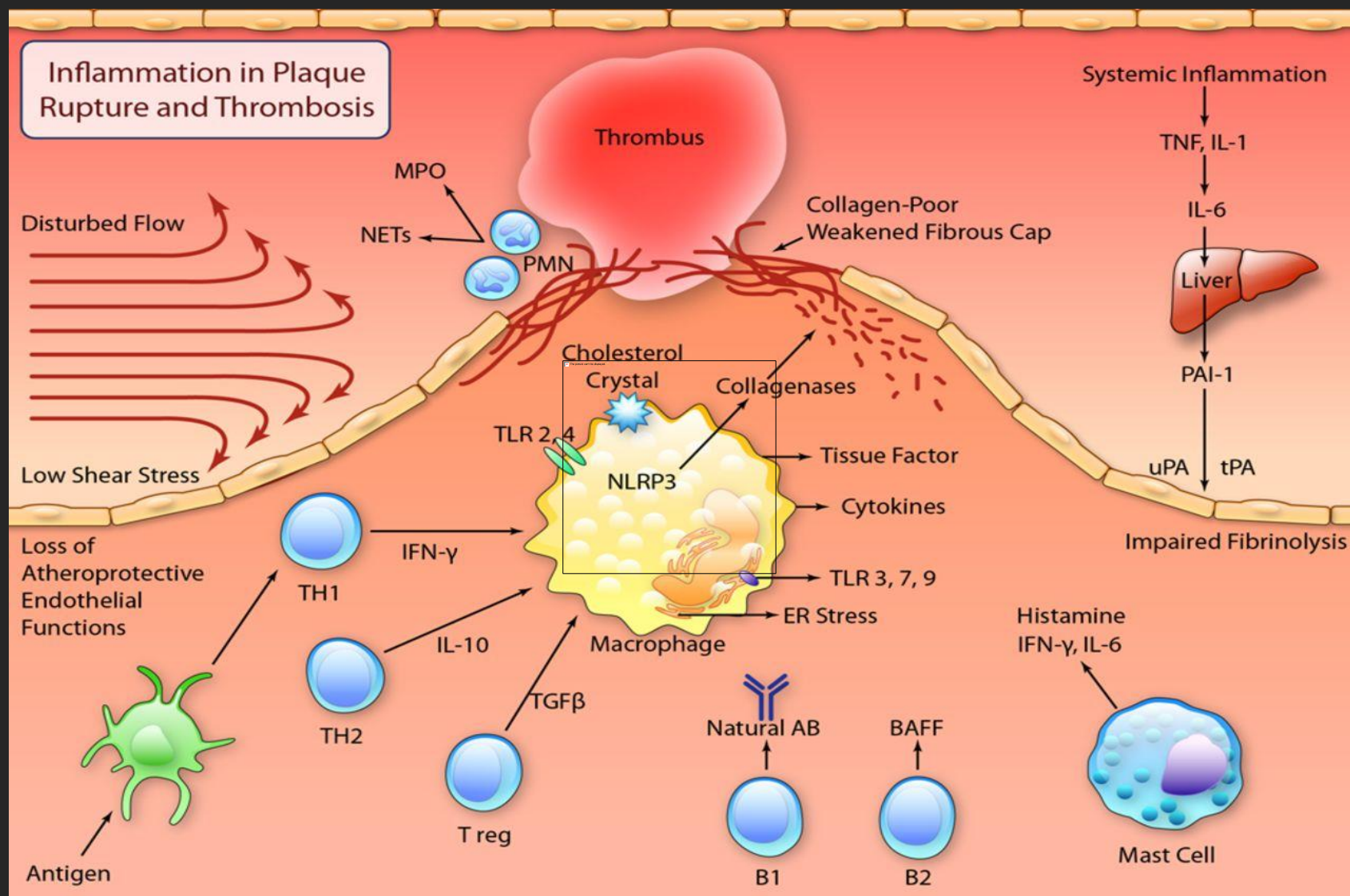


Failing to reduce the
epidemic

Dietary Guidelines



Inflammation in Plaque Rupture and Thrombosis

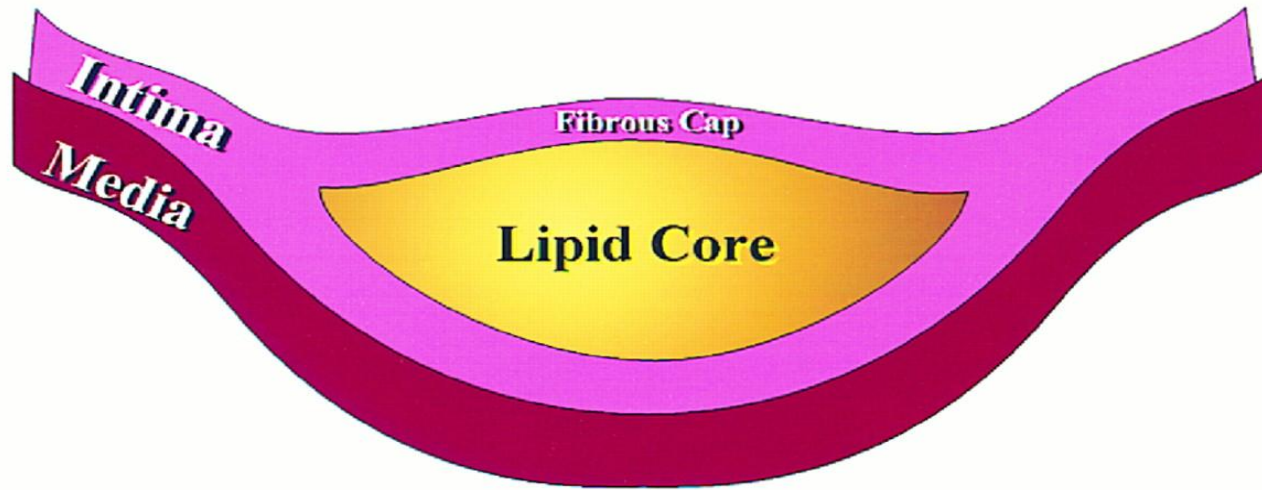


Factors increasing stress

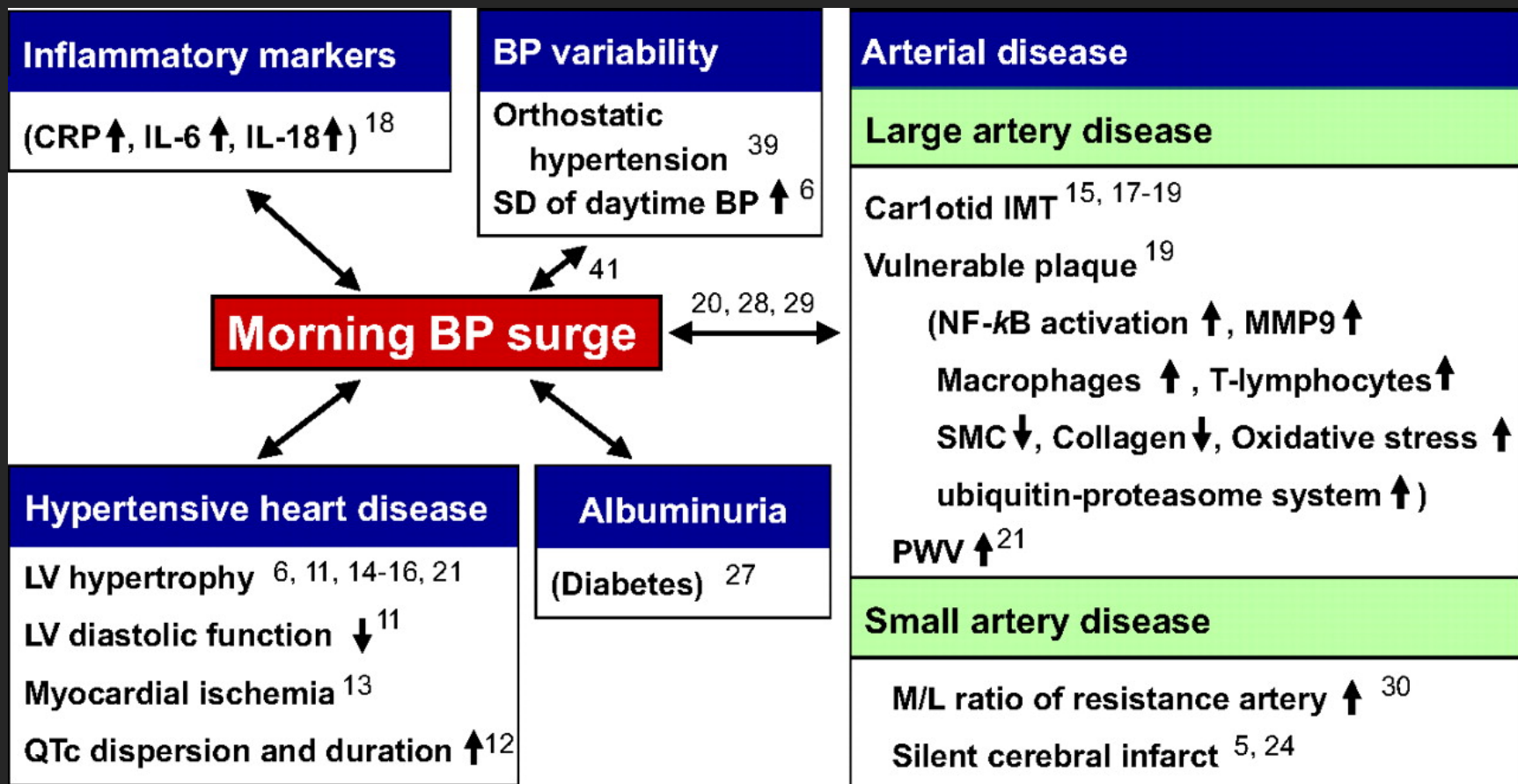
- thin fibrous cap
- large lipid pool
- less stenotic lesions
- ↑ (ester/free) cholesterol

Factors weakening the cap

- ↓ collagen synthesis
- ↑ collagen degradation
- ↑ macrophages, T-cells
- ↓ smooth muscle cells



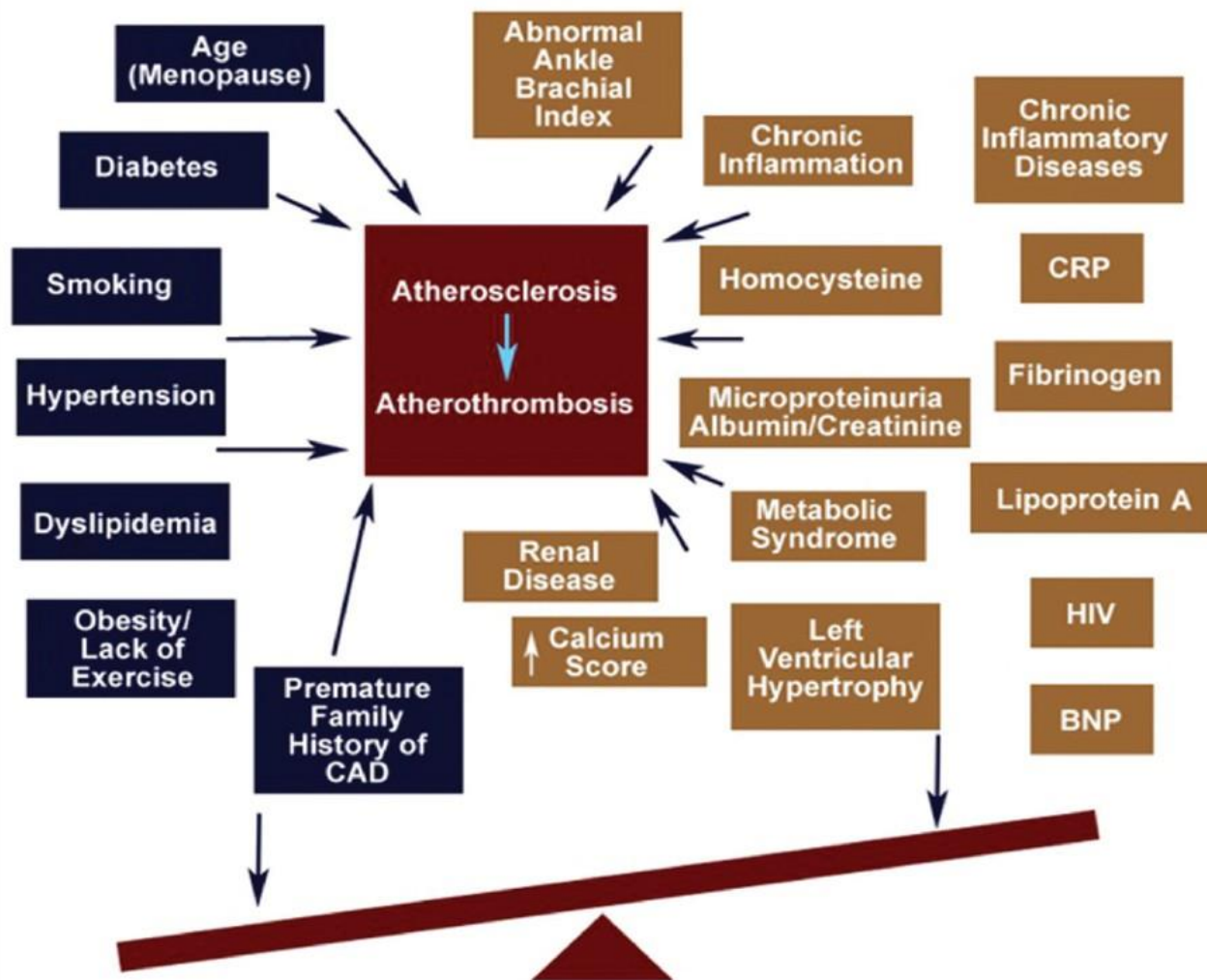
Biological and physical characteristics of plaques (including positioning) rather than the degree of luminal narrowing determine the risk for coronary occlusion.



BP, blood pressure; CRP, C-reactive protein; IL-6, interleukin 6, IL-18, interleukin 18; SD, standard deviation; LV, left ventricular; IMT, intima-media thickness; NF-kB, nuclear factor kappa B; MMP-9, matrix metalloproteinase-9; SMC, smooth muscle cell; PWV, pulse wave velocity, M/L ratio, media thickness to lumen diameter ratio

Traditional Risk Factors

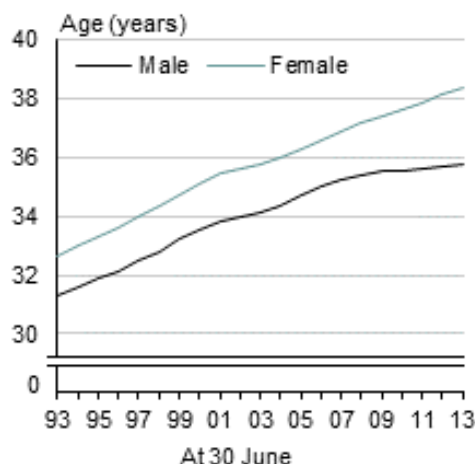
Non-Traditional Risk Factors



Median age

By sex

At 30 June, 1993–2013



Source: Statistics New Zealand

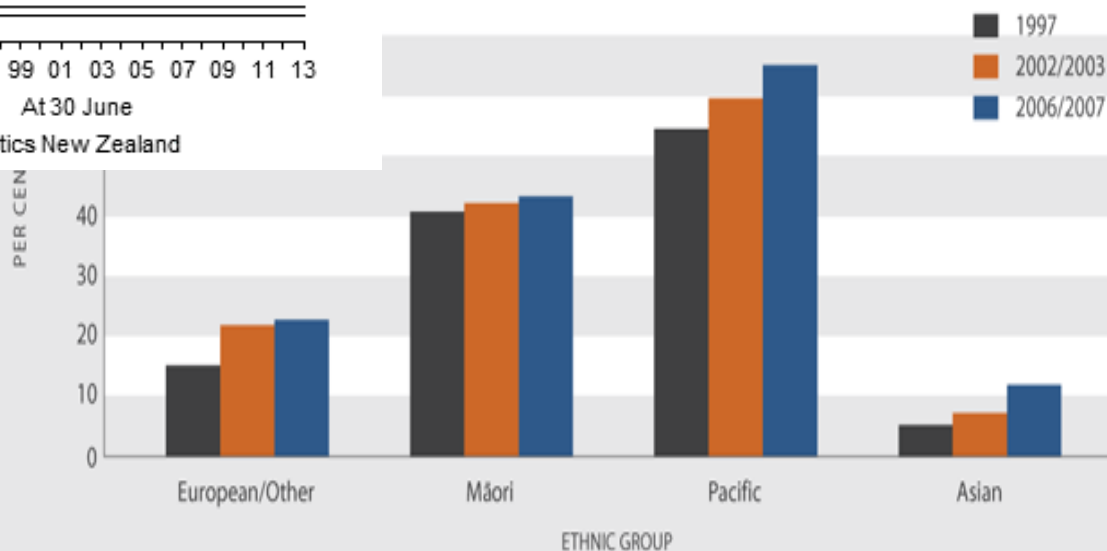
Table 1

New Zealand Population Age Structure Changes, 1901-1999

Age group (years)	1901	1926	1946	1966	1986	1999
Percentage Distribution						
Under 15	33	30	27	32	25	23
15-64	63	65	64	59	65	65
65+	4	5	9	8	10	12
Ratio of Under 15 to 65+	8:1	6:1	3:1	4:1	2.5:1	2:1
Median Age (years) ⁽¹⁾	23	26	30	26	30	34

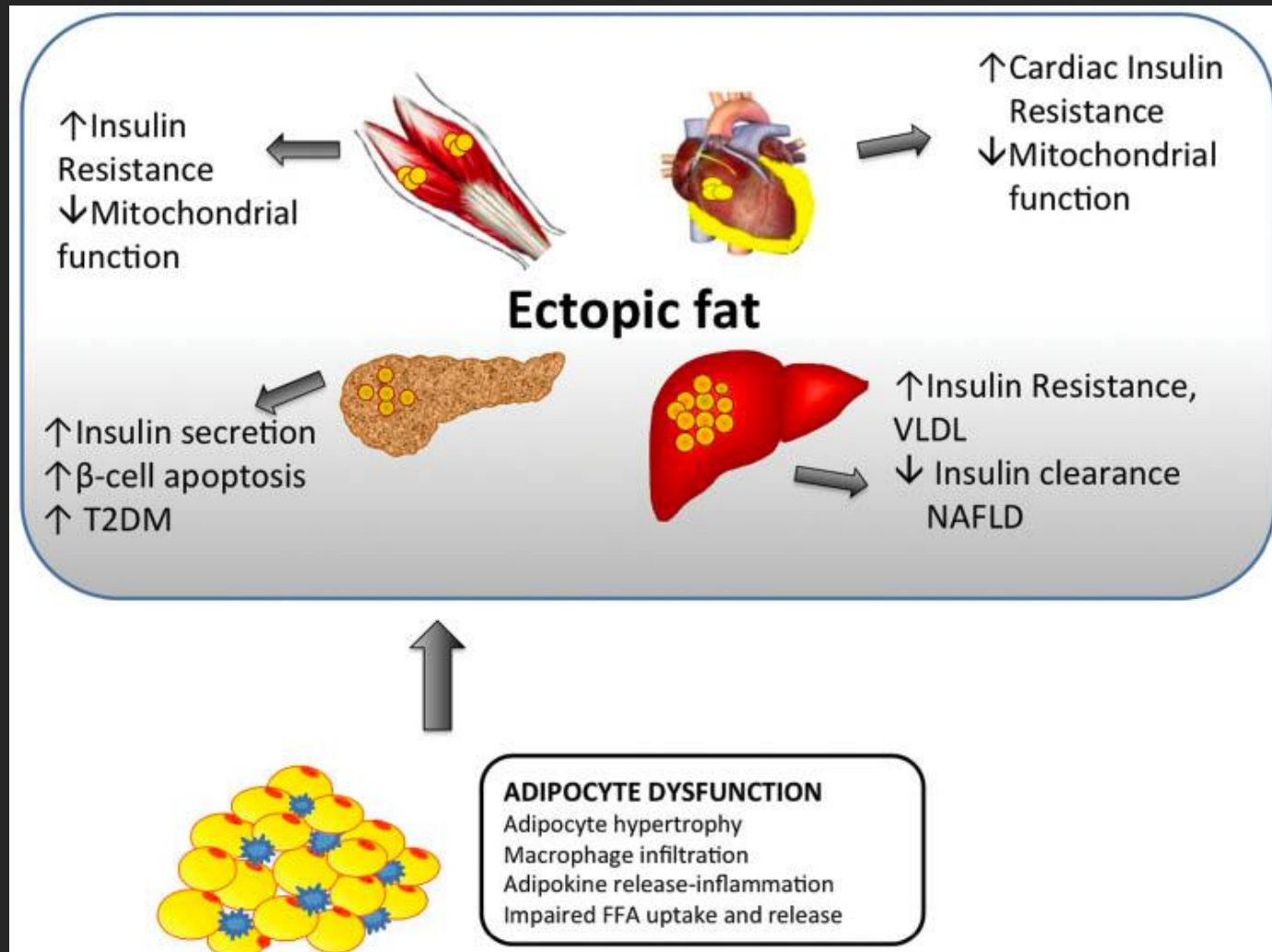
(1) Half the population is below this age.

PER CEN



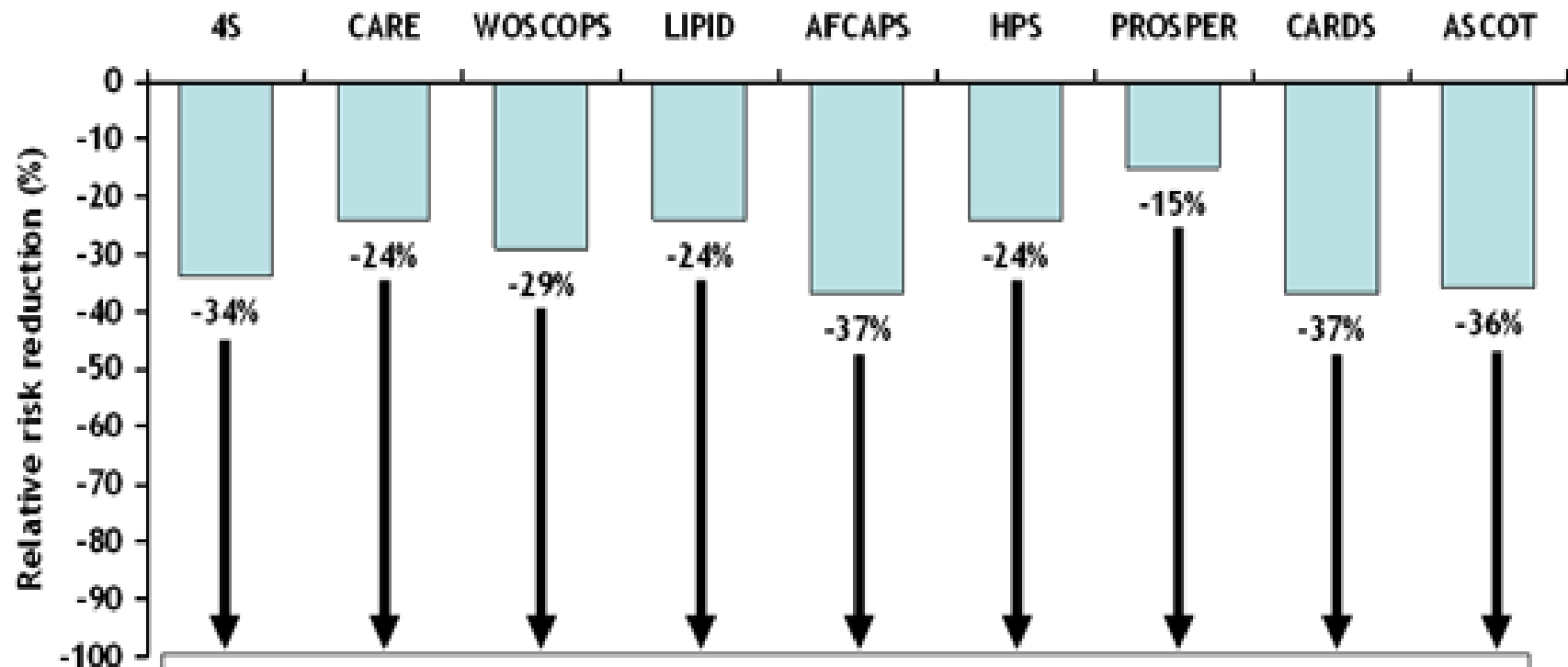
Obesity & Atherosclerosis







Therapies based on LDL-C lowering reduce the risks of CAD



Despite the benefits of LDL-C lowering,
60% to 80% residual risk remains





Triglyceride

- Adipose, liver, brain, skeletal muscle, pancreas.

Phospholipids & Sphingolipids

- Cell membranes

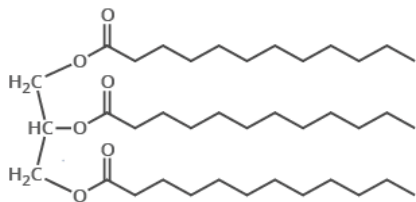
Eicosanoid & Prostaglandins

Resolvins & Protectins

A GUIDE TO THE DIFFERENT TYPES OF FAT

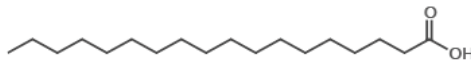
Fat is an essential part of our diets, and has a number of important roles in the body. However, there are different types, and there are health concerns surrounding eating too much of some types of fat. Here, we look at what distinguishes different types of fat, and their effects on the body.

TRIGLYCERIDES & FATTY ACIDS



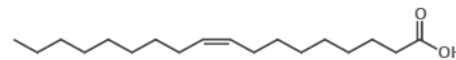
Triglycerides account for around 95% of the fat in our diet, and are formed from the combination of glycerol and three fatty acid molecules. The three fatty acids are often different, and the chemical structures of these fatty acids defines the type of fat. Cholesterol is made in the liver, and transported around the body by low density lipoproteins (LDL) and high density lipoproteins (HDL). Different fats affect LDL and HDL differently.

SATURATED FATS



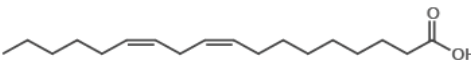
Contain no carbon-carbon double bonds. Saturated fats are solids at room temperature. They increase levels of LDL in the bloodstream. They have previously been associated with heart disease, though more recent studies and reviews have called this association into question.

MONOUNSATURATED FATS



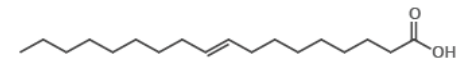
Contain one carbon-carbon double bond. They are liquids at room temperature, but solidify when chilled. They reduce levels of LDL in the bloodstream, thereby decreasing the total cholesterol to HDL ratio (HDL helps take cholesterol back to the liver where it can be disposed of).

POLYUNSATURATED FATS



Contain two or more carbon-carbon double bonds. They are liquids at room temperature, but they start to solidify when chilled. They are split into omega-3 and omega-6 fatty acids. Polyunsaturated fats help reduce LDL levels, decreasing the total cholesterol to HDL ratio.

TRANS FATS

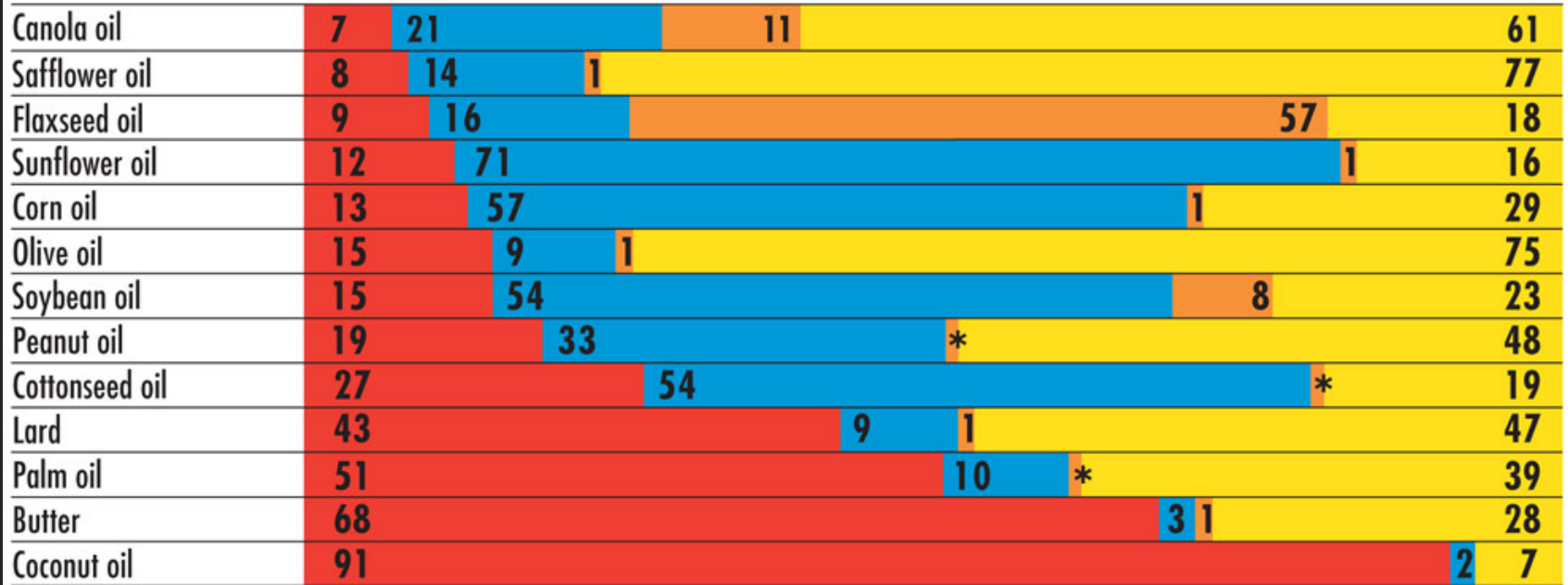


Contain carbon-carbon double bonds in a *trans* rather than *cis* configuration. Formed artificially, via a process called hydrogenation; also found naturally in small amounts in meat and dairy products. They raise LDL, and are associated with heart disease. Many countries are phasing them out.



Comparison of Dietary Fats

DIETARY FAT



SATURATED FAT



POLYUNSATURATED FAT



linoleic acid
(an omega-6 fatty acid)



alpha-linolenic acid
(an omega-3 fatty acid)

MONOUNSATURATED FAT



oleic acid
(an omega-9 fatty acid)

*Trace

Fatty acid content normalized to 100%

SOURCE: POS PILOT PLANT CORPORATION

Intake of individual saturated fatty acids and risk of coronary heart disease in US men and women: two prospective longitudinal cohort studies

Geng Zong,¹ Yanping Li,¹ Anne J Wanders,² Marjan Alsema,² Peter L Zock,² Walter C Willett,³ Frank B Hu,³ Qi Sun⁴

WHAT THIS STUDY ADDS

Lauric acid, myristic acid, palmitic acid, and stearic acid are associated with an increased risk of coronary heart disease, after multivariate adjustment of covariates. Risk of coronary heart disease is significantly lower when replacing the sum of these four major saturated fatty acids with polyunsaturated fat, whole grain carbohydrates, or plant proteins, with the lowest risk observed when palmitic acid, the most abundant saturated fatty acid, was replaced.

Because intake of major saturated fatty acids are highly correlated, current dietary recommendations should focus on replacing total saturated fat with unsaturated fats or whole grain carbohydrate, as an effective approach towards preventing coronary heart disease.



THE 5 BEST **HEALTHY FATS** for Your Body



A close-up photograph of a white ceramic coffee cup. A stream of dark brown coffee is being poured into the cup from above, creating a dynamic splash and bubbles on the surface. The cup is set against a background of dark, roasted coffee beans. A semi-transparent brown banner is overlaid across the middle of the image, containing white text. The cup sits on a white saucer, and some coffee beans are visible on a wooden surface to the left.

The Reason Why You Should Add Coconut Oil To Your Coffee Every Morning



10 Benefits of

Organic Coconut Oil



Table 1. Annual average vegetable oil prices (US\$/tonne) between 2001/02 and 2011/12 (USDA Feb 2013)

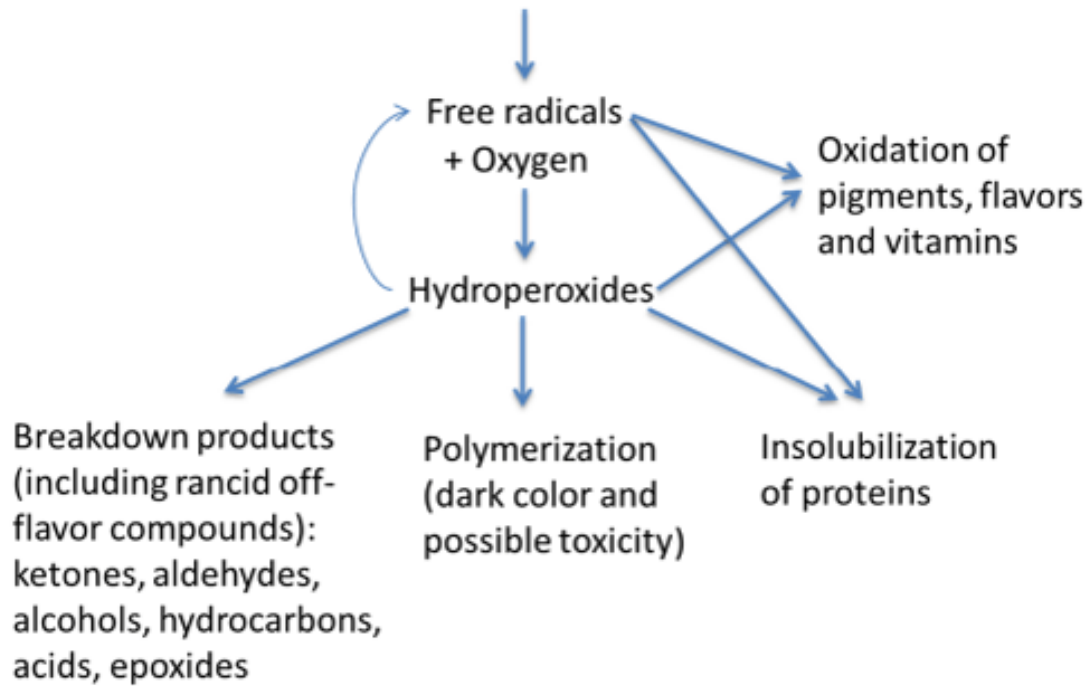
	Rapeseed	Palm	Sunflower	Soyabean
2001/02	451	329	587	412
2002/03	588	421	592	534
2003/04	670	481	663	633
2004/05	660	392	703	545
2005/06	770	416	635	573
2006/07	852	655	846	771
2007/08	1410	1058	1639	1327
2008/09	868	633	837	826
2009/10	927	793	956	924
2010/11	1367	1154	1404	1306
2011/12	1258	1032	1254	1241

Monthly figures show a larger fluctuation than annual figures, and maximum monthly prices in 2008 were palm (\$1291), soybean (\$1537), rapeseed (\$1577), and sunflower (\$2045).





Unsaturated fatty acid of Triglyceride



The Cooking Oil Comparison Chart

All oils contain a variety of fatty acids. Focus on the prominent ones. Learn more: <http://bit.ly/oilchart>

eating **RULES**
eatingrules.com
small bites
smallbites.andybellatti.com







Focus on any single nutrient/food fails to appreciate the complexity of life.

It is possible.

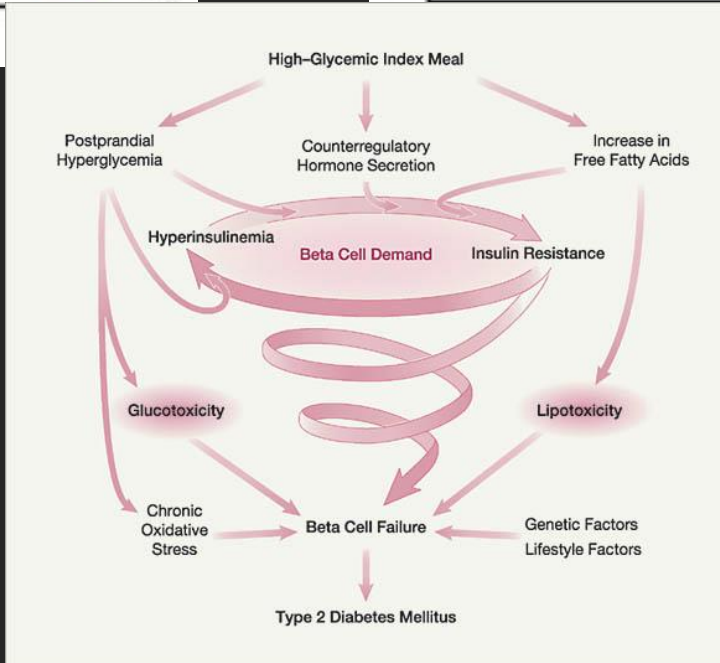
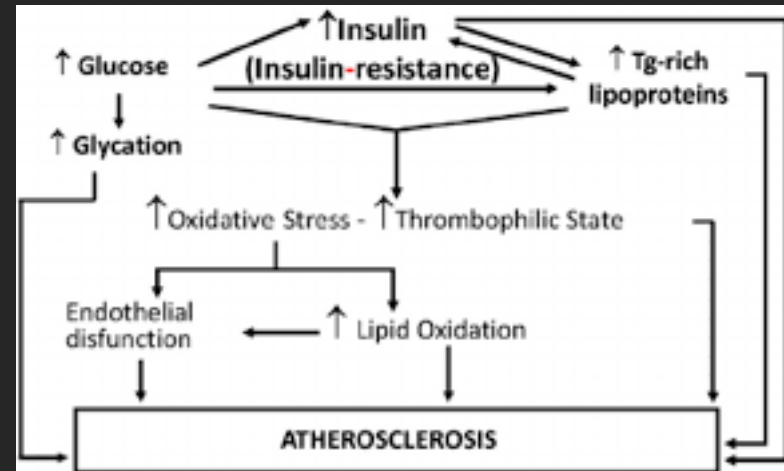
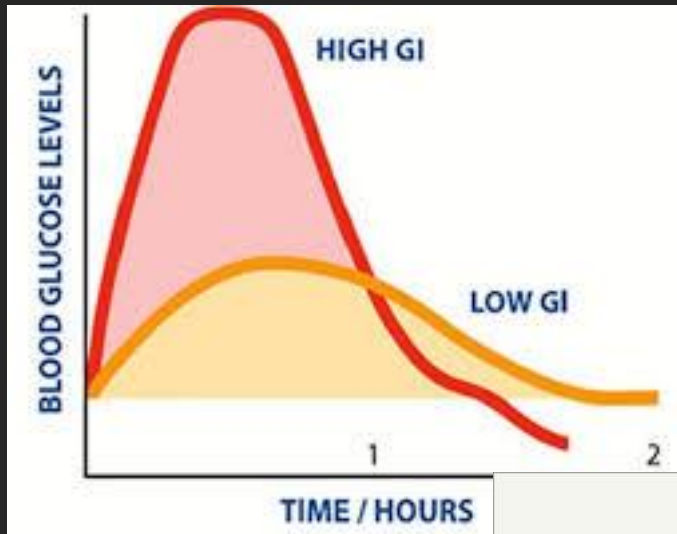
But not for the vast majority.



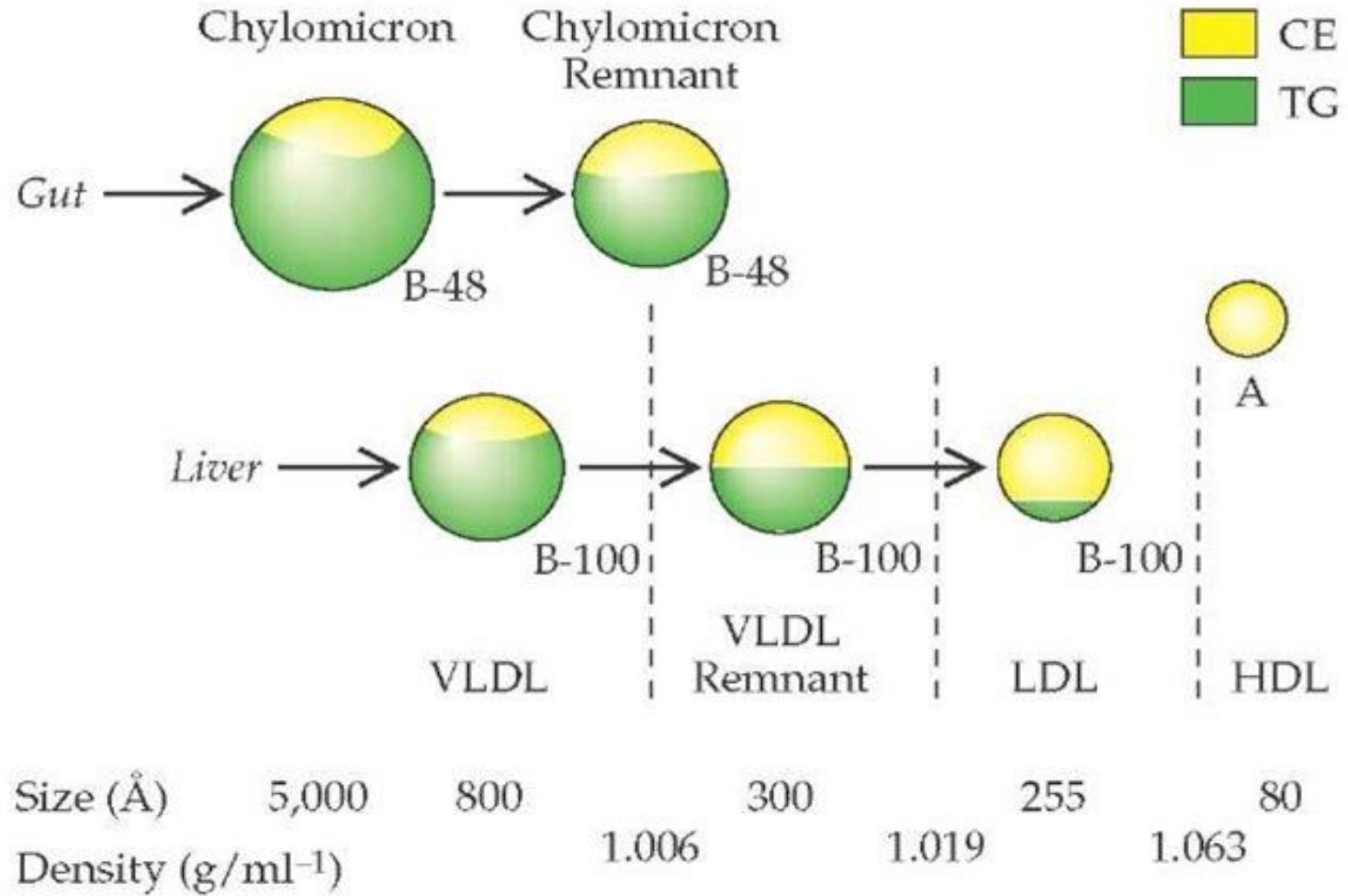


WAIT

**NO..... YOU DIDN'T..... YOU
ATE THE LAST COOKIE!!!!!!**







Benefit

Fruits, Nuts, Fish

Vegetables, Vegetable Oils

Whole Grains, Beans, Yogurt

Cheese

Eggs, Poultry, Milk

Butter

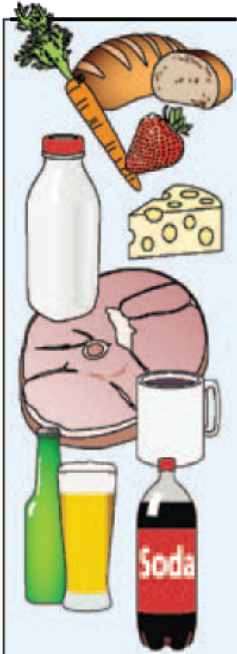
Unprocessed Red Meats

Refined Grains, Starches, Sugars

Processed Meats, High Sodium Foods

Industrial Trans Fat

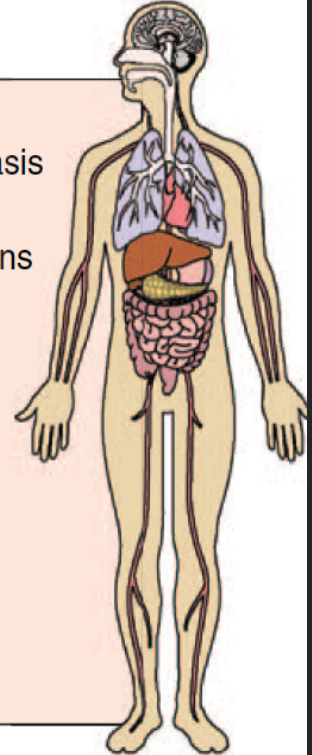
Harm



Refined grains, starches, sugars
Fruits, vegetables, nuts
Whole grains, legumes
Yogurt, cheese, milk
Fish, shellfish
Processed meats, red meats
Vegetable oils, specific fatty acids
Coffee, tea, alcohol
Sugary beverages, juice
Minerals, antioxidants, phytochemicals
Food-based dietary patterns
Food processing, preparation methods



Blood pressure
Glucose-insulin homeostasis
Liver fat synthesis
Blood lipids, apolipoproteins
Endothelial function
Systemic inflammation
Brain reward, craving
Gut microbiome
Satiety, hunger, obesity
Adipocyte function
Cardiac function
Thrombosis, coagulation
Vasular adhesion



Mediterranean Diet, Traditional Risk Factors, and the Rate of Cardiovascular Complications After Myocardial Infarction

Final Report of the Lyon Diet Heart Study

Michel de Lorgeril, MD; Patricia Salen, BSc; Jean-Louis Martin, PhD; Isabelle Monjaud, BSc; Jacques Delaye, MD; Nicole Marnelle, PhD

Background—The Lyon Diet Heart Study is a randomized secondary prevention trial aimed at testing whether a Mediterranean-type diet may reduce the rate of recurrence after a first myocardial infarction. An intermediate analysis showed a striking protective effect after 27 months of follow-up. This report presents results of an extended follow-up (with a mean of 46 months per patient) and deals with the relationships of dietary patterns and traditional risk factors with recurrence.

Methods and Results—Three composite outcomes (COs) combining either cardiac death and nonfatal myocardial infarction (CO 1), or the preceding plus major secondary end points (unstable angina, stroke, heart failure, pulmonary or peripheral embolism) (CO 2), or the preceding plus minor events requiring hospital admission (CO 3) were studied. In the Mediterranean diet group, CO 1 was reduced (14 events versus 44 in the prudent Western-type diet group, $P=0.0001$), as were CO 2 (27 events versus 90, $P=0.0001$) and CO 3 (95 events versus 180, $P=0.0002$). Adjusted risk ratios ranged from 0.28 to 0.53. Among the traditional risk factors, total cholesterol (1 mmol/L being associated with an increased risk of 18% to 28%), systolic blood pressure (1 mm Hg being associated with an increased risk of 1% to 2%), leukocyte count (adjusted risk ratios ranging from 1.64 to 2.86 with count $>9 \times 10^9/L$), female sex (adjusted risk ratios, 0.27 to 0.46), and aspirin use (adjusted risk ratios, 0.59 to 0.82) were each significantly and independently associated with recurrence.

Conclusions—The protective effect of the Mediterranean dietary pattern was maintained up to 4 years after the first infarction, confirming previous intermediate analyses. Major traditional risk factors, such as high blood cholesterol and blood pressure, were shown to be independent and joint predictors of recurrence, indicating that the Mediterranean dietary pattern did not alter, at least qualitatively, the usual relationships between major risk factors and recurrence. Thus, a comprehensive strategy to decrease cardiovascular morbidity and mortality should include primarily a cardioprotective diet. It should be associated with other (pharmacological?) means aimed at reducing modifiable risk factors. Further trials combining the 2 approaches are warranted. (*Circulation*. 1999;99:779-785.)



NEW USDA DIETARY GUIDELINES

AVOID
FATTY
MEATS

GET
DAILY
EXERCISE

EAT
YOUR
VEGGIES



Even in the face of a acute cardiac event -
lifestyle change (smoking, alcohol, inactivity, eating)
fails to change significantly
in most people.

But - knowledge goes up.

BEHAVIOR NEVER LIES

GARY RYAN BLAIR



**KEEP
CALM
AND
LIE ABOUT YOUR AGE**

Healthy Start Workforce Project



**Online
education
programme**

Why

nutrition and
physical activity
matter in early life



**Healthy
Conversation
Skills**

How

to effectively
support lifestyle
behaviour change



**Website /
Facebook**

More

News, emerging
evidence and
interaction