Fat, Carbohydrate and Type 2 Diabetes

- The role of fat and carbohydrates in diabetes
- The prevention and reversal of type 2 diabetes explained

Cause of Type 2 Diabetes has been known prior to the 1920s

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What is Diabetes?

Diabetes mellitus is a group of diseases that is characterised by high levels of blood glucose. The term is usually shortened to diabetes. Diabetes is derived from the Greek via Latin meaning *siphon* which refers to the increase in urination. *Mellitus* relates to honey which refers to the increase in sugar in the urine.

For a person with Type 2 diabetes, the problem is that sugar (glucose) is not able to pass from the bloodstream into the cells. Since the glucose cannot get into the cells, it ends up in the blood stream and removed from the body in urine.

> It seems obvious that if you have too much sugar in your blood then you need to limit the amount of sugar and starch in your diet. Starches are complex carbohydrates that consists of many glucose molecules. Glucose is the result of the digestion of starches.

According to *Diabetes Australia* website:

> Type 2 diabetes is a progressive condition in which the body becomes resistant to the normal effects of insulin and/or gradually loses the capacity to produce enough insulin in the pancreas. We do not know what causes type 2 diabetes. Type 2 diabetes is associated with modifiable lifestyle risk factors. Type 2 diabetes also has strong genetic and family related risk factors. [1]

Notice the assertion that "we do not know what causes type 2 diabetes." The same page states, "While there is currently no cure for type 2 diabetes, the condition can be managed through lifestyle modifications and medication. Type 2 diabetes is progressive and needs to be managed effectively to prevent complications."

Included in their advice for a healthy diet is the following advice to reduce saturated fat.

- Choose reduced or low-fat milk, yoghurt, cheese, ice-cream and custard
- Choose lean meat and trim any fat off before cooking
- Remove the skin from chicken, duck and other poultry (where possible, before cooking)
- Avoid using butter, lard, dripping, cream, sour cream, copha, coconut milk, coconut cream and hard cooking margarines
- Limit pastries, cakes, puddings, chocolate and cream biscuits to special occasions
- Limit pre-packaged biscuits, savoury packet snacks, cakes, frozen and convenience meals
- Limit the use of processed deli meats (devon/polony/fritz/luncheon meat, chicken loaf, salami etc) and sausages
- Avoid fried takeaway foods such as chips, fried chicken and battered fish and choose BBQ chicken (without the skin) and grilled fish instead
- Avoid pies, sausage rolls and pastries
- Rather than creamy sauces or dressings, choose those that are based on tomato, soy or other low fat ingredients
- Limit creamy style soups.

Diabetes Australia also claims that "the Protein foods are needed by the body for growth and repair. Protein does not break down into glucose, so it does not directly raise blood glucose levels."

Whilst it is true that it does not directly break down into glucose, but the consumption of protein does raise blood glucose.

Diabetes Australia recommend the following protein foods.

- Meats, chicken, fish, & tofu
- Egg
- Nuts & seeds
- Cheese

Cows, elephants, gorillas, mammoths and brontosauruses obtain all their protein needs from non-animal sources. Lentils, peas, tofu, leafy green vegetables and grains contain significant amounts of protein.

Consuming more protein than needed is detrimental to health.

Sweeney Experiments from 1927

It has been known since at least 1927 that high-fat diets increase insulin resistance. Sweeney assigned healthy, young medical students into four dietary groups: [2] [3]

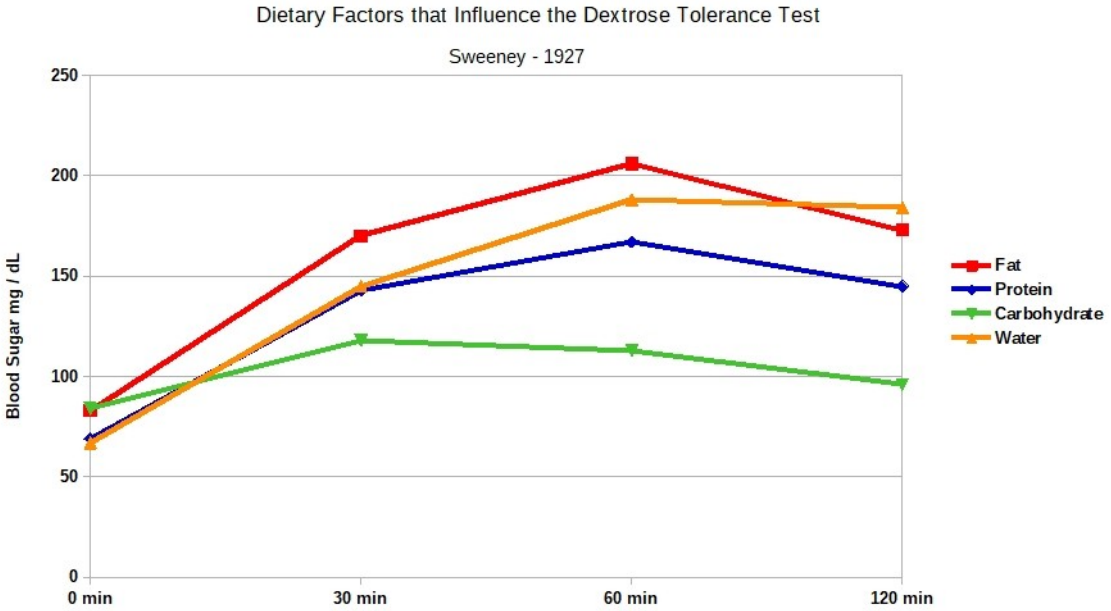
- high-carbohydrate diet consisting of sugar, candy, syrup, baked potatoes, bananas, oatmeal, rice and white bread
- high-fat diet consisting of olive oil, butter, mayonnaise, egg-yolks and cream
- high-protein diet consisting of lean meat, lean fish and egg-whites
- the fourth group was placed on a fasting regime

The students were fed their diets for two days and a glucose tolerance test was performed on the morning of the third day.

The students who consumed the high-carbohydrate showed an increase in tolerance for dextrose; those on the high-protein diet showed a mild inability to remove sugar from the blood; those on the high-fat and starvation diets showed a significant decrease in their tolerance for sugar.

After only two days on their experimental, improbable diets, the only group showing a normal, healthy response to the glucose tolerance test was the high-carbohydrate group.

The area under the graph represents glucose resistance – greater the area, greater the resistance. Sweeney's experiments clearly shows that high-carbohydrate diets DO NOT cause insulin resistance. Here we are 90 years later still debating an issue that has already been resolved.



The only result showing a normal response to the glucose tolerance tests was the high-carbohydrate diet.

The Cause of Type 2 Diabetes

If you type "*intramyocellular lipids diabetes*" into a Google Scholar search, you will receive hundreds of search results that documents the cause of type 2 diabetes. "*Intramyocellular lipids diabetes*" refers to fats inside muscle cells. The type of fat is irrelevant.

Normally, insulin attaches to protein receptors on the cell's surface and signals the cell membrane to allow glucose to enter. If there is an accumulation of fat in the cell, it interferes with insulin's signalling process and glucose cannot enter the cell. Fat can accumulate inside muscle cells even in slim people. The real cause of type 2 diabetes is not an excess of sugar or carbohydrates. It is an accumulation of fat inside the cells that interferes with the muscle cells ability to respond to insulin. The muscle cells are unable to access glucose, which is required for energy production.

Three Comparative Studies

McDougall – Results After Seven Days

McDougall [4] showed significant improvement in diabetic and cardiovascular markers after seven days on a low-fat, plant-based diet. Carbohydrate intake was approximately 80% of total energy with fat representing 10% or less.

The diet consisted of no animal-derived products or isolated vegetable oils. Meals included whole-wheat flour products, corn, rice, oats, barley, quinoa, potatoes, sweet potatoes, beans, peas, lentil, fresh fruits and non-starchy green, orange and yellow vegetables. The macro-nutrient profile was approximately 7% fat, 12% protein and 81% carbohydrate by energy consumption. [5]

After only seven days, there was a substantial reduction to relevant bio-markers. The reduction occurred even though 86% of patients on blood pressure medications and 90% of patients on diabetes medications reduced their dosage or discontinued the medication.

Barnard – A Low-Fat Vegan Diet Improves Diabetic and CVD Risk Factors

An intervention trial, published in 2006, compared 99 individuals being treated for type 2 diabetes. 49 were placed on a low-fat vegan diet and 50 on a diet following the American Diabetes Association (ADA) diet. The results were compared after a 22 week period.

In every criteria measured, the participants in the low-fat vegan diet performed better than those following the ADA diet. The values shown are the average of the two groups. [6]

Criteria	Vegan			ADA		
	Start	End	Δ %	Start	End	Δ %
Cholesterol medications reduced	-	-	-10%	-	-	-9%
Diabetic medications reduced	-	-	-51%	-	-	-34%
Weight (kg)	33.9	31.8	-6%	35.9	34.3	-4%
BMI (kg / (m • m))	33.9	31.8	-6%	35.9	34.3	-4%
HbA1C (Exc those who reduced medication)	8.07	6.84	-15%	7.88	7.50	-5%
Total cholesterol (mmol/L) (Exc those who reduced medication)	4.93	4.06	-18%	5.05	4.56	-10%
LDL cholesterol (mmol/L) (Exc those who reduced medication)	2.78	2.19	-21%	2.99	2.71	-9%
Urinary albumin (mg/24 h)	33.0	14.6	-56%	55.0	43.7	-21%

The reduction of HbA1C that excludes the medication is more relevant as it removes the confounding results of participants reducing their medication.

Haemoglobin is a protein that contains iron that colours the blood red. About 92% of haemoglobin is HbA (A for adult) with other components being A1a1, A1a2, A1b and A1c. HbA1c binds to glucose and is also referred as glycosylated haemoglobin. The blood test HbA1c is used to determine how well diabetes is controlled. Normal range is less than 6%. This range is stable and reflects the blood glucose levels over a period of 6 to 8 weeks.

Meckling- A Low-Fat Diet compared with Low-Carbohydate Diet

Meckling [7] evaluates the outcomes of a number of trials that compared low-fat diets with low-carbohydrate diets. This study included the Westman study which is discussed previously.

The tables below are derived from the papers by Meckling and Barnard. [8]

Dietary components		Low-fat diets		Δ %	Low-carb diets		Δ %	Plant-based diet		Δ %
		Start	End		Start	End		Start	End	End
Energy	kJ	8617	6077	-29.5	9616	6421	-33.2	7365	5965	-19.0
Protein	g	82.4	70.9	-14.0	88.6	100.6	13.5	77	51	-33.8
Protein	% energy	16	19.5	21.9	15.4	26.2	70.1	18	14	-22.2
Fat total	g	80.9	28.8	-64.4	90.8	94.6	4.2	72	30	-58.3
Fat	% energy	36.4	17.8	-51.1	35.6	55.5	55.9	36	18	-50.0
SFAs	g	29.2	9	-69.2	30.3	33.9	11.9	23	6	-73.9
MUFAs	g	28.6	9.5	-66.8	32.6	37.3	14.4			
PUFAs	g	13.4	5.9	-56.0	16.8	13.7	-18.5			
Cholesterol	mg	293	162	-44.7	308	556	80.5	291	24	-91.8
Carbohydrate	g	251	225	-10.4	287	59	-79.4	205	251	22.4
Carbohydrate	% energy	49	61.9	26.3	50	15.4	-69.2	47	68	44.7
Sugars	g	23.8	20.5	-13.9	22.6	1.4	-93.8			
Fiber	g	17.8	20.3	14.0	19.8	8.9	-55.1	18.8	36.3	93.1

The *Low-Fat* and *Low-Carbohydate* diets were restricted in the amount of energy consumed which confounds the results. People do not like to feel hungry and deprived.

Note the ratio for fat (14%), carbohydrate (68%), and protein (18%) in the plant-base diet group and the large increase in the amount of fibre to 36 g.

Metabolic factors		Low-fat		Δ %	Low-carb		Δ %	ADA diet		Δ %	Plant-based		Δ %
		Start	End		Start	End		Start	End		Start	End	
HbA1c	%	8.3	7.8	-6.0	8.8	7.3	-17.0	7.9	7.4	-6.3	8.0	7.1	-11.3
Glucose	mmol/L	9.26	8.37	-9.6	9.88	8.77	-11.2	8.88	6.94	-21.8	9.05	7.11	-21.4
Systolic BP	mmHg	140	130	-7.1	144	127	-11.8	122	119	-2.5	123	120	-2.4
Diastolic BP	mmHg	84	78	-7.1	83	75	-9.6	80	77	-3.8	78	73	-6.4
Cholesterol	mmol/L	4.91	4.76	-3.1	4.94	4.84	-2.0	5.12	4.50	-12.1	4.86	4.11	-15.4
LDL-cholesterol	mmol/L	2.92	2.87	-1.7	2.72	2.78	2.2	3.05	2.66	-12.8	2.67	2.28	-14.6
HDL-cholesterol	mmol/L	1.34	1.14	-14.9	1.27	1.41	11.0	1.35	1.22	-9.6	1.29	1.21	-6.2
Triglycerides	mmol/L	1.51	1.13	-25.2	1.54	1.08	-29.9	1.78	1.50	-15.7	1.67	1.35	-19.2

The authors of the Meckling paper are attempting to prove that *Low-Fat* diets are better than *Low-Carbohydrate* diets of diabetes and cardiovascular disease.

- With the exception of cholesterol, the *Low-Carbohydate* diet have a greater percentage reduction than the *Low-Fat* diet.
- Cholesterol had a smaller reduction on the *Low-Carbohydrate* diet. Since HDL-Cholesterol substantially increased on the *Low-Carbohydrate* diet then it results in negative impact on Total-Cholesterol. Despite the medical profession claiming that a high HDL-Cholesterol is beneficial, it is a fallacy. As Professor William Roberts, long-time editor of the journal

Cardiology wrote, the relevant indicators are Total Cholesterol of 130mg/dL [3.9mmol/L] and LDL-Cholestrol of 60mg/dL [1.6mmol/L]. [9]

- With the exception of triglycerides, the *ADA* diet out-performed the *Low-Fat* diet. High triglycerides are *not* a high-level risk factor for cardiovascular disease.
- With the exception of glucose and systolic blood pressure which were the same, the *Plant-Based* diet, out performed the *ADA* diet.

Conclusions

It is difficult to obtain an accurate comparison between different studies because of different durations of the trials, the medications that the participants are taking often changes, and the initial state of health. Ketogenic trials focus on diabetes and obesity with the majority of participants being female and very overweight.

There are, however, several common features.

- LDL-cholesterol typically rises on ketogenic diets.
- HDL-cholesterol also increases. This is not as beneficial as supporters will have us believe.
- Serum cortisol increases which is associated with an increase in stress. The decrease in serum glucose is much greater on the ADA diet and plant-based diet than the "l*ow-fat*" diets and l*ow-carbohydrate, ketogenic* diets. Remember that the Westman study participants were taking nutritional supplements that decreased serum glucose.
- Completion rates are very low with "*almost half of the studies included in our meta-analysis had completion rates less than 70%.*"

Seven-day Adventist Studies

A strong commitment to health has been a part of Adventist's tradition since its founding in the 1840s. The Adventist Health Study-1 (HP-1) study showed 30-year-old Adventist males lives 7.3 years longer than the average 30-year-old white Californian male and with females living 4.4 years longer than the average Californian white female. For vegetarians, it is 9.5 years longer for men and 6.1 years longer for women.

The comparison of the types of diet (in the AHS-2) showed a significant difference in both the body weight and the incidence of type 2 Diabetes. [10]

In every criteria measured, the participants in the low-fat vegan diet performed better than those following the ADA diet. The values shown are the average of the two groups.

Category	%	BMI (kg / m$^{2)}$	Prevalence Type 2 Diabetes (%)	Odd ratio (*)
Vegan No red meat, fish, poultry, dairy, eggs	4.2	23.6	2.9	0.51
Lacto-ovo vegetarians Vegan with eggs and milk	31.6	25.7	3.2	0.54
Pesco-vegetarians Vegan with fish, milk and eggs	11.4	26.3	4.8	0.70
Semi-vegetarians Red meat, poultry less than once a week plus fish, milk, and eggs	6.1	27.3	6.1	0.76
Non-vegetarians Red meat, poultry more than once a week plus fish, milk, and eggs	46.8	28.8	7.6	1

(*) After adjustment for age, sex, ethnicity, education, income, physical activity, television watching, sleep habits, alcohol use and BMI.

The Odd Ratio is indicative of the relative risk of Type 2 diabetes compared with Californian non-vegetarian Seventh-day Adventists. This is even more impressive given that non-vegetarian Adventists are much healthier than the average American—and Californians in general are much healthier than the average Americans, exceeded in life expectancy only by Hawaii and Minnesota. Californians expect to live six years longer than those in the Mississippi states

Vegetarians and vegans usually have a relatively high-fat diet, even though the fats are derived from plants. A much healthier alternative is a whole-food, plant-based diet with no added oils of any kind.

Making Changes

Dr James Anderson is Emeritus Professor at the University of Kentucky who has been researching diabetes for more than 30 years. He advocates a high-carbohydrate, high-fibre diet for treating diabetes.

> Ideally, diets providing 70% of calories as carbohydrate and up to 70 gm fibre daily offer the greatest health benefits for individuals with diabetes. However, these diets allow only one to two ounces of meat daily and are impractical for home use for many individuals. [11]

Living with diabetes is not always practical either.

The diet of people that live in countries that have low incidence of diabetes do not have a diet remotely like the standard diabetic diet. They eat a diet that is high in complex carbohydrates.

In type II diabetes, insulin is created in the pancreas and is transported via the blood to each cell. However, the insulin is unable to pass through the cell membrane – a condition known as insulin resistance. This is due to a build-up of fat (intramyocellular lipids) inside skeletal muscle cells. [12] [13] [14] [15]

Since there are only 3 major components of food – fats, proteins and carbohydrates, if you reduce carbohydrates then you will be increasing fats or proteins. ***It is the increase of fats in the diet that cause diabetes – not an increase in carbohydrates***. Excess protein is broken down into amino acids and eliminated by the kidneys. This increases the renal acid load on an intricate filtration system that will eventually fail to perform at optimal levels.

Instead of limiting the amount of fruit, we need lots of fruit and vegetables – no added sugars – no added oils.

> If people are on diabetic medication and go on a low-fat diet, then there is a real danger of hypoglycaemia as well as low blood pressure. The blood glucose levels can drop so quickly that you can be at risk.

Pure, White and Deadly – John Yudkin

John Yudkin was the first professor of nutrition at Queen Elizabeth College in London.

During the 1960s, John Yudkin noted that the consumption of sugar increased in Britain more than any other food item in the last 100 years. Both sugar consumption and total fat consumption (note the correlation is with total fat and not saturated fat) correlated with heart disease but Yudkin concluded that sugar was the more likely cause. [16]

Professor Stewart Truswell of the University of Sydney has written extensively about the limitations of Yudkins "*research*". Professor Truswell succeeded Yudkin as head of the Department of Nutrition at Queen Elizabeth College in 1971.

Yudkin performed a small study recording the sugar intakes of 70 men: 20 with a recent first heart attack, 25 with peripheral arterial disease and 25 healthy men. The mean daily intakes were 132, 141 and 77 g, with medians 113, 128 and 56g, respectively. The intakes of the patients were significantly higher than those of the healthy controls. Both groups of patients took more sugar in more cups of tea or coffee per day than controls. [17]

Yudkin also performed a feeding experiments with rats. A diet high in sugar increased serum triglycerides. Triglycerides are no longer considered to be a high risk factor for heart disease.

A number of researchers, including Jeremiah Stamler, Gerry Shaper, Michael Oliver, Geoffrey Rose as well as Ancel Keys were of the opinion that "*there was no firm evidence linking intake of dietary sugar and CHD*." [18]

Ancel Keys, Geoffrey Rose and many others criticised Yudkin because "*he did not have the data*" to support his contention that sugar caused heart disease. If an investigator makes claims regarding their research, it is absolutely essential that research findings are available to support it.

It is not true that these researchers gave sugar a "*clean bill of health*".

Ancel Keys wrote in 1971 that,

> None of what is said here should be taken to mean approval of the common high level of sucrose in many diets. [19]

Mortality from heart disease started reducing in 1966 in the US, Finland, and Australia. It was another 10 years before this happened in the United Kingdom because of Yudkin's influence. [20]

Rose believed that there would have been 25,000 fewer deaths in England and Wales if the gains made in Australia and America were duplicated in the United Kingdom. [21] When viewed in that light, Yudkin's legacy is not very inspiring.

His best-selling book *Pure, White and Deadly: the problem with sugar* [22] contained no references. Lustig wrote the introduction for the reissue of the book in 2012.

Fruit is OK

Frequently medical and dietetic advice is to avoid fruit because of the high level of the simple sugars, glucose and fructose. The high-fructose fruits include apples, cherries, mangoes, watermelon and pears. Other fruits high in total sugars include figs, grapes and bananas.

A Harvard Health newsletter states, "***The nutritional problems of fructose and sugar come when they are added to foods. Fruit, on the other hand, is beneficial in almost any amount***." Obtaining sugars in your diet from whole foods is significantly different from adding them as isolated components. Avoidance of fruit juices is advisable.

Eggs and Diabetes

A number of popular authors and websites advocate eating eggs as a way of preventing type 2 diabetes. However, this does not substantiated by the evidence.

To assess the impact of egg consumption on type 2 diabetes in China, a survey was performed among 2849 adults in Jiangsu Province, China. Jiangsu is a coastal Chinese province north of Shanghai. [23]

Dietary information was obtained by a validated food frequency questionnaire and 3 day weighed food records. Note that this survey did not rely on dietary recall.

Egg consumption was significantly and positively associated with diabetes risk. Below is the risk of diabetes according to egg consumption.

Egg consumption	Women Odds ratio	Men Odds ratio
Less than 2 eggs per week	1.00	1.00
2-6 eggs per week	**1.67**	**2.03**
1 egg per day or greater	**3.22**	**2.44**

Those participants eating more that 2 eggs a week had a significant increase in the prevalence of diabetes compared to those consuming less than 2 eggs per week.

Women eating 2-6 eggs per week had an increase of risk for diabetes of 1.67 with men 2.03. For women consuming 1 egg per day or more, the increase of risk for diabetes women was 3.22 and for men 2.44.

The same study showed plasma triglyceride and total cholesterol levels were significantly higher, particularly with women, who consumed 2 eggs/week or more. [24]

The conclusion of this paper is,

> Considering the high percentage of participants who consumed more than 1 egg/d in this population and the substantially increasing burden of diabetes in China and worldwide, a clearer message on egg consumption and diabetes risk is needed.

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A Lithuanian study showed similar results. This study compared people eating less than 1 egg/week (the previous study was comparing those eating 1 egg/week). Eating 3-4 eggs per week resulted in a 2.6 times increase in diabetes and whilst 5 or more eggs/week resulted in a 3 times increase compared with those eating less than 1 egg/week. [25]

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The Physicians' Health Study commenced in 1981. It consisted of a study of 22, 071 male doctors between 40 and 84 years of age in the US. [26]

The role of egg consumption on health was examined. The result from a 20-year follow-up showed a significant correlation between egg consumption and all-cause mortality.

Egg consumption was divided into 5 categories—less than 1 egg per week, 1 egg per week, 2–4 eggs, 5–6 eggs per week and 7 or more eggs per week.

A key finding is that physicians consuming 7 or more eggs per week had a 31% increase in all-cause mortality compared with those consuming less than 1 egg per week. For diabetic physicians, the association was much higher with the increase in mortality slightly more than doubled.

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A British study followed 10,802 health-conscious individuals in the UK with an average follow-up period of 13.3 years. This study reported a 2.7 times increase in risk of death from heart disease with an egg consumption greater than 5 eggs per week compared with those who ate eggs less than once a week. [27]

Moderation is a Fatal Thing

Everything in moderation is a near unanimous response by health professional, health support organisations and media commentators to solving our health crisis.

The Seventh-day Adventists studies show that significant health outcomes between *semi-vegetarians* (red meat, poultry less than once a week plus fish, milk, and eggs) and *non-vegetarians.*

A *Taiwanese Buddhist study* [28] with 4,384 participants compared type 2 diabetes outcomes for lacto-ovo-vegetarians compared with those who consumed meat. The meat-eating group ate only a very small amount of meat.

- Meat intake for females: 50% consumed less than 10 g/day; 25% consumed less than 2 g/day;
- Meat intake for males: 50% consumed less than 20 g/day; 25% consumed less than 7 g/day.;
- Fish and meat intake for females: 50% consumed less than 17 g/day; 25% consumed less than 3 g/day
- Fish and meat intake for males: 50% consumed less than 37 g/day; 25% consumed less than 11 g/day.

There were insufficient numbers to divide the vegetarians into subgroups (pesco, lacto-ovo, vegan). There were 69 vegans (no animal products) and there were no cases of diabetes within this group.

One Big Mac, with 2 meat patties, contains 90 g of meat—so the participants were consuming only a very small amount of meat. Three garden peas weigh a gram.

That tiny amount of meat increased the risk of diabetes 4 times for females and 2 times for males. Not an endorsement for moderation.

Category	**Pre-Menopausal Women**		**Menopausal Women**		**Men**	
Diet type	Vegetarian	Omnivore	Vegetarian	Omnivore	Vegetarian	Omnivore
Diabetes %	0.6	2.3	2.8	10	**4.3**	**8.1**
Impaired Fasting Glucose %	5.8	9.0	14	18	**12**	**17**

For those interested, the p-values for the diabetes outcomes for pre-menopausal, menopausal and men cohorts were 0.0006, <0.0001 and 0.0014 respectively.

American Diabetes Guidelines

The American Diabetes Association has many "*Recipes for Healthy Living*" featured on their website. Below is the full list from their Featured Recipes website. [29]

- Grilled Lamb Kabobs with Garlic Lemon Vinaigrette
- Mango Chicken Salad with Jicama
- Broccoli, Mushroom, and Cheddar Omelette
- Greek Salad (Feta Cheese)
- Pork Pita Pocket
- Avocado BLT (Bacon, Lettuce and Tomato)
- Long Leaf Tex-Mex Chicken Salad Wraps
- Baked Red Snapper with Golden Onions

None of these recipes are conducive to improved health or diabetic outcomes. Even avocado (without the bacon) is an issue with people who are overweight or have diabetes because of the high fat content. Added oils in the dressings are also detrimental.

Fats Make You Fat

Another common misconception is that carbohydrate foods make you fat. There is no mechanism for humans to convert glucose to fat. Excess carbohydrates are stored as glycogen – a complex carbohydrate consisting of branches of glucose which is stored in the liver and muscles. Carbohydrates are not converted to fat. Fats are stored as fats.

Limiting carbohydrates for any reason results in an increase in the consumption of fats and protein. Instead of solving the problems of obesity and diabetes, limiting carbohydrates contributes to it.

Further Reading

The studies of Neal Barnard and John McDougall demonstrate that type 2 diabetes is not a condition that is inevitable. Both of their programs are based on a whole-food, plant-based diet with no added oils. Neal Barnard has produced a book, *Dr Neal Barnard's Program to Reverse Diabetes*, outlining his program. [30]

John McDougall has written several books, including The Starch Solution. [31]

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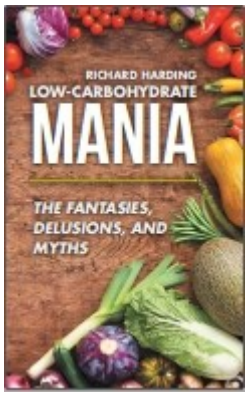

I have written a book, *Low-Carbohydrate Mania: The Fantasies, Delusions, and Myths*, that examines the advice contained in many popular books, magazines and websites claim that we have been following expert medical advice for the past 40 years and we are unhealthier than ever. They declare that the idea that saturated fats and cholesterol cause heart disease is the greatest scientific deception of our times and that a high-fat, low-carbohydrate diet is essential for our well-being.

These views have become accepted as the truth. Instead of informing our society about healthy dietary choices, they are causing widespread harm.

However, standard medical advice has not been helpful in reducing the rising prevalence of obesity, diabetes, and autoimmune diseases. This advice often contains guidance such as "*everything in moderation"* and that we need to be "*practical*" and "*flexible*".

Advice which is not very constructive.

Fortunately, the diets that are optimal for our health are also the best for the environment and for the animals we share the earth with.

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