

Low carbohydrate, high fat diets for diabetes

Low carbohydrate, high fat diets for diabetes mellitus?

Low carbohydrate, high fat diets have recently re-emerged (having last been popular in the 1970's), and have caught the attention of some members of the scientific community and the public. Dietitians want to make the management of diabetes mellitus easier and strive to provide the best possible advice to the public as the nutrition science continues to evolve. So what about 'Low Carb, High Fat'? Is it really the best if you have diabetes? And, is it sustainable?

The primary purpose of this Hot Topic is to summarise the key conclusions of the best available evidence, based on two systematic review and meta-analysis papers (references 5 and 6 listed below).

What are the goals of diabetes care?

When you have diabetes mellitus, the aim is to manage your blood glucose levels, your blood fats and blood pressure as best as possible. Advice about food and eating is very important because in both the short term (3-6 months), and the long term (2 or more years), it influences your health and how you feel.

Advice should always be supported by the best quality science and be individualised for each person to match their health goals, personal and cultural preferences, their access to healthy choices, and their readiness and willingness to change^[1]. To this end, there is no single optimal diet for all people who have diabetes – there are many different ways of eating well^[2].

What is a low carbohydrate diet?

Well, that's part of the problem . . . 'low carbohydrate' is poorly defined.

In research, some have used 'Very Low Carbohydrate Ketogenic Diets' (VLCKD) with amounts from 20-50g carbohydrate per day (less than four 'portions'). These diets often omit whole food groups and make it impossible to meet all known nutrient and fibre targets, and therefore could not be recommended for diabetes management in the long term².

Others have suggested that 'Low' is <130g/day (26% of energy based on a person's intake of 8,400kJ/day). 'Moderate' carbohydrate falls between 130-230g/day (26-45% of energy based on a person's intake of 8,400kJ/day) and then 'High' carbohydrate is >230g/day (45% of energy based on a person's intake of 8,400kJ/day)^[3].

In its 'Carbohydrates and Health Report' (2015)[\[4\]](#), the Scientific Advisory Committee on Nutrition (UK) recommended that the dietary reference value for total carbohydrates should be maintained at an average population intake of around 50% of total dietary energy.

A recent systematic review and meta-analysis of a variety of diets (Low Carbohydrate, Low Glycaemic Index (GI), Mediterranean and High Protein) for people with diabetes, found some benefits for a low carbohydrate diet in the short term[\[5\]](#). Including:

- Some improvement in HbA1c (although the Low GI diet and the Mediterranean diet performed better on this measure)
- Weight loss (although those in the Mediterranean diet group lost more weight)
- Improved HDL cholesterol (also seen in the Low GI and Mediterranean diet groups).

When it comes to weight loss, Naude et al (2014)[\[6\]](#) examined nineteen trials (n=3,209) and were also able to confirm that weight loss occurs in the short-term, irrespective of the proportion of macronutrients. They found no difference between low CHO or "balanced diets" in regards to weight loss (or cardiovascular risk factors) even when participants are followed up for up to two years. There was also no difference in weight loss or CVD risk factors in participants who were overweight or obese or in those with or without type 2 diabetes.

One of the main problems is that it can be difficult to translate this Low Carbohydrate diet into foods, without dramatic changes to the types of foods normally eaten. Unfortunately, this can create challenges for people who live with others (such as in a family setting) to adjust the diet to suit everyone in the household and it may risk some members nutritional needs, particularly children and adolescents.

Also, some people may incorrectly believe that this type of diet means they can simply eat more meat. This is not true. For health reasons, the [Australian Dietary Guidelines](#) place a limit on meat consumption at ~455g/week for adults. People with diabetes may also be misled by the idea of replacing some carbohydrates with foods high in saturated fat – however, research shows this can actually increase insulin resistance².

Important information about carbohydrate foods

The **amount**, **type** and **frequency** of carbohydrate foods in a diet pattern is an important consideration in the management of diabetes mellitus. Foods that are considered [carbohydrate choices are many and varied](#), and are of differing quality. Low GI food choices (GI<55) are important in selecting the right carbohydrate foods for you. And overall, the reduction in total energy (kilojoule) intake is key to glycaemic control in most people with diabetes (type 2). Dietitians also recommend people with diabetes spread their carbohydrate food choices over the day, to assist with glycaemic control.

According to Diabetes Australia[\[7\]](#), very low carbohydrate diets are not recommended for people with diabetes. The organization states: 'If you eat regular meals and spread your carbohydrate foods evenly throughout the day, you will help maintain your energy levels without causing large rises in your blood glucose levels' (Diabetes Australia website, 2015). Diabetes Australia recommends people with diabetes eat moderate amounts of carbohydrate and include high-fibre foods that also have a low glycaemic index (GI).

Are carbohydrate foods needed by the body?

While there are specific requirements for amino acids (from proteins) in the diet, and essential fatty acids (from fats), there is talk that there is no specific requirement for carbohydrate.

This is not true. Both your brain and red blood cells require glucose and while some can be supplied by breaking down proteins in your body, there are a number of reasons why this is not beneficial and is specifically not recommended – for example, during childhood (due to growth requirements) and during pregnancy. The long-term effect of placing this demand on the body has also not been tested and there is evidence to suggest that performance in mental and physical tasks could be affected. Therefore, a diet that is very low in carbohydrate may not be physically or mentally **sustainable** as a diet pattern.

In addition, carbohydrate foods supply many nutrients. These include B vitamins and fibre from grains, and vitamins, minerals, dietary fibre and other plant components such as antioxidants from fruit and starchy vegetables. So without careful planning, it can be more difficult to meet nutrition needs on a low carbohydrate diet.

Consistent evidence indicates that in general, dietary patterns higher in plant-based foods such as vegetables, fruits, wholegrains, legumes, nuts and seeds, and lower in animal-based foods are more beneficial for overall health. This type of diet also has a lower impact on the environment and is therefore more environmentally **sustainable** as a recommendation for the population.

What are Australians eating?

From the latest National Nutrition Survey^[8], data suggests on average Australians are consuming about 222g of carbohydrate per person per day, making up 43.5% of total energy intake (Australian Bureau of Statistics, 2011-12). This indicates a ‘Moderate’ carbohydrate intake across the population. Furthermore, for Australians, this amount has decreased since the last National Nutrition Survey in 1995.

What if I don’t have diabetes? Is this diet right for me?

The Australian Dietary Guidelines have been designed for healthy populations and suggest people have from 45%, and up to 65%, of their total energy intake from carbohydrate foods. This is purposefully a wide range, to account for factors such as a person’s level of physical activity and personal food preferences. The Dietitians Association of Australia (DAA) recommends seeking advice from an Accredited Practising Dietitian (APD) before dramatically altering your diet or that of your family – especially if you are considering cutting out whole food groups.

A word on saturated fats

In ‘Low Carb, High Fat’ diets, a variety of fats have also been suggested as replacements for carbohydrate foods. Some LCHF diets promote foods like coconut oil and animal fats (such as lard and butter), often suggesting these are more ‘natural’ sources of fat. DAA believes this is misleading.

All fats are rich in energy (kilojoules) – containing twice the amount of kilojoules as either protein or carbohydrate – so if eaten in large amounts, can make weight control more difficult. The [Australian Dietary Guidelines](#) recommend Australians limit intake of foods high in saturated fat.

Foods high in saturated fat include:

- Many biscuits, cakes, pastries, pies, processed meats, commercial burgers, pizza, fried foods, potato chips, crisps and other savoury snacks

- Butter, cream, cooking margarine, coconut and palm oil.

The final word

A Low Carbohydrate, High Fat diet may be used by some nutrition professionals in the short term to achieve particular health goals, but the effectiveness and safety of the diet has not been examined in the longer term. An argument for the use of the diet can potentially be supported by ‘established principles in biochemistry and physiology’³, however long-term randomised controlled trials with consistent dietary methodology are lacking.

Therefore, this diet type remains controversial – and DAA believes more research is required on the safety and efficacy of such as diet, in people with diabetes and the general population. What we do know from the evidence is that eating a wide variety of nutritious foods, in the right amounts, is crucial to optimal health. DAA recommends people with diabetes seek advice from a health professional before dramatically changing their diet.

[1] Evert et al (2014) Nutrition Therapy Recommendations for the Management of Adults With Diabetes. Diabetes Care Volume 37, Supplement 1; p S120-143.

[2] Dworatzek et al (2013) **Canadian Diabetes Association Clinical Practice Guidelines Expert Committee, Canadian Journal Of Diabetes**, Vol. 37 Suppl 1, p S45-55.

[3] Feinman et al (2015) Dietary carbohydrate restriction as the first approach in diabetes management: Critical review and evidence base Nutrition 31; p 1–13.

[4] Scientific Advisory Committee on Nutrition (2015). Carbohydrates and Health. The Stationary Office Limited. Available from: www.tsoshop.co.uk

[5] Ajala et al (2013) Systematic review and meta-analysis of different dietary approaches to the management of type 2 diabetes. American Journal of Clinical Nutrition, Vol. 97 Issue 3, p 505-516.

[6] Naude et al (2014) Low Carbohydrate versus Isoenergetic Balanced Diets for Reducing Weight and Cardiovascular Risk: A Systematic Review and Meta-Analysis. PLoS ONE 9(7): e100652. doi:10.1371/journal.pone.0100652.

[7] Diabetes Australia: <https://www.diabetesaustralia.com.au/what-should-i-eat> accessed July 2015.

[8] Australian Bureau of Statistics, 2011-12. Australian Health Survey: Nutrition First Results – Foods and Nutrients, 2011-12
<http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/4364.0.55.007main+features12011-12>
accessed July 2015.

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