

Popular diets and Type 2 diabetes

Recent years have seen the emergence of a number of alternative approaches to weight loss. **Dr Pamela Dyson**, Research Dietitian at the Oxford Centre for Diabetes, Endocrinology & Metabolism, reviews the evidence for popular diets and how they apply to people with Type 2 diabetes

The health benefits of weight loss for people with Type 2 diabetes are well-established. However, many find conventional weight loss strategies challenging and are interested in trying less traditional, more popular approaches, such as the Fast or Paleolithic diet. These diets have certainly been well-publicised, but is there any evidence of safety or efficacy for people with Type 2 diabetes?

Intermittent fasting and the Fast (5:2) Diet

Intermittent fasting (IF) is characterised by days of eating normally and fasting days, where energy intake is typically restricted to 500–600 kcal/day. Despite its recent popularity, there is in fact little evidence for the 5:2 diet, and there have been no studies evaluating its effect in people with diabetes. There is more evidence for alternate day fasting, and proposed benefits include weight loss, increased lifespan, slowing the rate of cognitive decline and preventing heart disease, cancer and Type 2 diabetes¹, but the majority of studies have been carried out in animals and there are relatively sparse data for humans.

Those who decide to try IF should be advised that there is no evidence of efficacy in people with diabetes, and that those taking insulin or insulin secretagogues (sulfonylureas and glinides) are at risk of hypoglycaemia during fast days, and will need to reduce or omit their medication to avoid this. Home blood glucose monitoring is also advised.

Paleolithic diet

Also known as the caveman diet or the Stone Age diet, the Paleolithic diet consists of foods that were available before agriculture was introduced. It includes lean meat, game and poultry, fish, eggs, leafy and root vegetables, fruit, nuts and seeds. Excluded from the diet are grains, such as wheat and rice, legumes, dairy produce, salt, refined sugar and processed oils. A few small studies have suggested that this diet benefits people with Type 2 diabetes and the reported effects include reduction in weight and cardiovascular risk factors² and improvements in satiation and glucose tolerance when compared to a Mediterranean diet³. There is insufficient published evidence for the safety or efficacy of the Paleolithic diet to recommend it in clinical practice.

Low glycaemic index (GI) diets

Low GI foods reduce the degree of postprandial hyperglycaemia and associated insulin secretion,

and this action is proposed to benefit people with diabetes. Several reviews and meta-analyses have confirmed that low GI diets improve glycaemic control in people with diabetes and reduce cardiovascular risk⁴. However, low GI diets are now no longer recommended as a primary strategy for Type 2 diabetes by Diabetes UK, due to the absence of evidence for any effect on body weight and the difficulties of discerning an independent effect on glycaemic control.

There are also concerns about translating low GI diets into practice, as they can be difficult to understand and implement. This may be counterproductive for those who are attempting weight loss and trying to improve glycaemic control.

High protein/low carbohydrate diets

High-protein, low-carbohydrate diets have been widely promoted in recent years as an effective approach to losing weight and improving glycaemic control in people with Type 2 diabetes. The Atkins-style diet tends to be high in both protein and fat and low in carbohydrate, whereas diets such as the Zone diet and the South Beach diet combine high protein with low fat and a moderate intake of carbohydrate, usually derived from fruit, vegetables and whole grains.

Although reviews have shown benefits in terms of glycaemic control and weight loss over the short term⁵, this advantage disappears in longer trials. Reductions in carbohydrate intake increase the risk of hypoglycaemia in people taking taking insulin, sulfonylurea or glinide therapy and requires dose adjustment.

Mediterranean diet

There has been interest in the Mediterranean diet as means of reducing cardiovascular risk, promoting weight loss and improving glycaemic control in people with Type 2 diabetes, with several studies showing a significant positive effect of this diet on these outcomes^{5,6}. The diet is based on plant foods and includes plenty of vegetables, fruit, beans and pulses, nuts, seeds and cereal foods such as bread and pasta, with olive oil providing the principal dietary fat. Dairy foods (usually milk and yogurt), eggs and fish are consumed in moderate amounts, and red meat and processed foods are avoided. Wine is drunk in moderate amounts, usually with meals. The Mediterranean diet, unlike low carbohydrate or high protein diets, is food-based rather than nutrient-based and it has been proposed that this may improve its accessibility and understanding. There are also no

documented side effects for Mediterranean diets, and medication adjustment is not usually required, unless there is significant weight loss.

Very low calorie diets

Very low calorie diets (VLCD) have long been used to induce significant weight loss in people with Type 2 diabetes. They provide <1000kcal/day, and may go as low as 450–800kcal/day. Such diets can be provided from either foodstuffs (usually accompanied by a vitamin and mineral supplement) or, more commonly, from liquid food (often a proprietary formula) that provides the sole source of nutrition and includes the full complement of vitamins, minerals, electrolytes and fatty acids. These products are known as very low calorie liquid diets (VLCLD).

A Cochrane review reports that use of VLCLD significantly improves⁷ HbA1c and results in a weighted mean difference of 3kg weight loss in people with Type 2 diabetes, although the weight loss is not significantly different from that achieved by conventional low calorie diets. These diets have come to the fore recently, with the results of a trial reporting reversal of Type 2 diabetes in 11 subjects consuming 600kcal/day over eight weeks⁸, and this is supported by other evidence⁹. However, it is probably too early to draw conclusions from this, and results from a larger trial are awaited.

There are a number of issues with VLCLD in practice, and their use should only take place under medical supervision. In common with other very restrictive diets, including IF and low carbohydrate, adjustment of medication is necessary to avoid hypoglycaemia, and frequent blood glucose monitoring is recommended. Those who are successful with weight loss may find weight maintenance challenging and it is likely that individuals will need dietary counselling once food is reintroduced, as rapid weight regain following normal eating is common.

Conclusions

There is no evidence, as yet, for the most effective dietary strategy for weight reduction, improving glycaemic control and reducing cardiovascular risk in people with Type 2 diabetes. Guidelines from Diabetes UK¹⁰ recommend an individualised approach, where health professionals work with the person with diabetes to identify an eating pattern based on that individual's lifestyle, culture and preferences. Suitable evidence-based strategies include conventional healthy eating low fat diets, low GI diets, low carbohydrate diets, and Mediterranean diets. Blood glucose monitoring and medication adjustment are necessary for those on low carbohydrate diets. Other popular diets, including the Fast diet and the Paleolithic diet, are not supported by evidence, have side effects including hypoglycaemia and are not currently recommended for people with diabetes. More extreme dietary restriction using VLCLD requires medical supervision and, although there is limited evidence of effect, more studies are needed before this strategy can be recommended for general use. In conclusion, although many popular diets may be promoted for weight loss in people without diabetes, lack of evidence prevents use of many of these approaches in people with Type 2 diabetes.

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Effects of popular diets on glycaemic control, body weight and cardiovascular risk in people with Type 2 diabetes

Type of diet	HbA1c (%)	Body weight (kg)	HDL cholesterol (mmol/l)	LDL cholesterol (mmol/l)	Triglycerides (mmol/l)
Intermittent fasting	No data	No data	No data	No data	No data
Paleo-lithic†	-0.4*	-3.0*	0.08*	-0.1*	-0.4*
Low GI††	-0.14*	1.39	0.05*	-0.07	-0.01
Low carbohydrate††	-0.12*	-0.69	-0.08*	-0.03	-0.04
Very low calorie††	-1.23*	-2.95	-0.06	Not reported	0.17
Mediterranean††	-0.47*	-1.84*	-0.04*	-0.04*	-0.21*

† Data from one small, short-term cross-over study with 13 subjects

†† Data from meta-analyses and Cochrane review^{27,45}. All data presented as WMD
* p<0.05

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