

## Issue 285 In a nutshell

Many of the dietary approaches that have been used to improve glucose control in type 2 diabetes involve variations in one or more of CHO, protein and fat.

Extra protein does enhance insulin response short term, but we lack evidence of a long term benefit. Limited evidence suggests a similar benefit from monounsaturated fats.

## Diet for diabetic control - part 1

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## NUTRITION RESEARCH REVIEW

### Study 1: Systematic review of systematic reviews

A new Dutch study has analysed what can be gleaned from the collective body of systematic reviews of research addressing the effectiveness of nutrition interventions in type 2 diabetes.

**Method:** Six systematic reviews were included, of which three focussed on dietary interventions in general (the other three were on fish oil, chromium and herb/nutrition supplements).

**Results:** The authors found methodological flaws in many of the reviews. There was evidence that some dietary approaches could result in weight loss, but the only collated evidence that any dietary strategy significantly affected diabetic control was in one review showing that various dietary interventions (e.g. reduced energy, very-low-calorie, protein-sparing modified fast) reduced glycosylated haemoglobin by 2.7%.

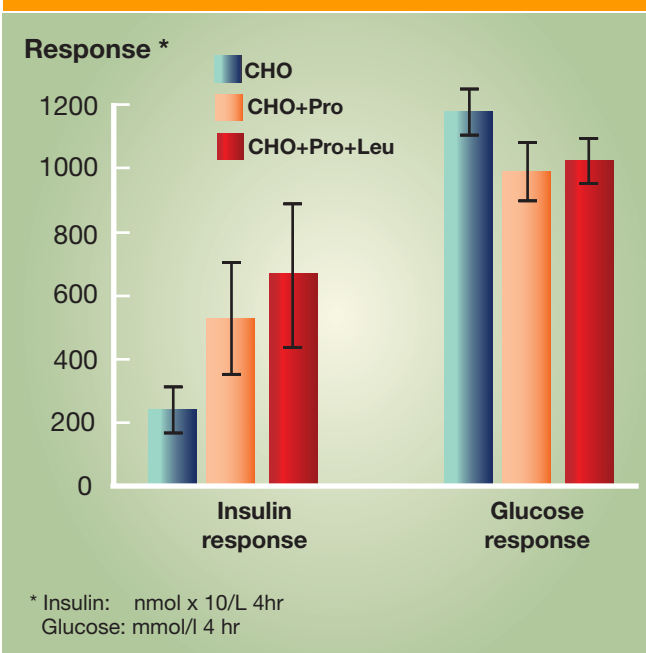
*Ref.: van de Laar FA, et al. Limited evidence for effects of diet for type 2 diabetes from systematic reviews. Eur J Clin Nutr. 2007 Aug;61(8):929-37.*

### Study 2: RCT on protein for glycaemic control

A European trial investigated the impact of protein supplementation on glucose control in type 2 diabetes.

**Method:** RCT of 'crossover' design. Ten type 2 diabetics and 10 healthy controls each consumed in random order (each separated by at least 7 days) a drink containing either carbohydrate (CHO) alone, or CHO with added protein hydrolysate, or CHO + protein + extra leucine.

**Graph: Response 4 hrs after ingestion of drink:**  
(Study 2)  $p < 0.05$  for both CHO-protein, c.f. CHO alone



**Results:** Compared to CHO alone, the CHO-protein drink resulted in a 141% greater insulin response and 15% lower glucose response (both  $p < 0.05$ ). The further addition of leucine increased the insulin stimulating effect - see Graph. Similar effects were also seen, but less markedly, in the healthy control subjects.

*Ref.: Manders RJ, et al. Co-ingestion of a protein hydrolysate with or without additional leucine effectively reduces postprandial blood glucose excursions in Type 2 diabetic men. J Nutr. 2006 May;136(5):1294-9.*

## COMMENTARY

As the incidence of type 2 diabetes continues to skyrocket across the globe, finding the optimal dietary management for it is a very important priority.

Most dietary recommendations focus first and foremost on reducing overweight, and controlling hyperlipidaemia. The strategies suggested to achieve this are similar to those for non-diabetic subjects <sup>1,2</sup>.

These are obviously important goals. Research on metabolic syndrome has shown us that, far from being just side issues or complications of type 2 diabetes, they are part of the core mechanism. A good proportion of the most recent American Diabetes Association dietary guidelines for diabetes, for example, is devoted to weight loss <sup>1</sup>.

Even so, the question remains as to whether any particular dietary strategy is best suited to the problem of diabetic control itself, i.e. directly improving glucose handling and insulin response.

What new Study 1 suggests is sobering - that it is hard to find a strong evidentiary basis, within systematic reviews of randomised controlled trials, to support any one dietary approach. Or indeed to show that dietary management is effective as a whole. In the words of one of the meta-analyses included in that Study: "There are no high quality data on the efficacy of the dietary treatment of type 2 diabetes" <sup>3</sup>.

Perhaps this is only to be expected, when one thinks of just how many different, sometimes contradictory, approaches to 'diabetic diet' have been proposed over the years.

Those approaches have included changing in various ways the intake of protein, carbohydrate (CHO) (including the glycaemic index and fibre content), fatty acid profile (e.g. more fish oil), and minerals such as zinc, magnesium and chromium <sup>1,2,4-8</sup>.

The most widely canvassed of these has been altering CHO intake, for instance through CHO exchange. But the most striking thing about CHO recommendations over the years is how much they have varied <sup>9</sup>.

There are many aspects to question of CHO intake, including the obvious fact that how much of it you consume is closely related to how much you have of the other energy-producing macronutrients, protein and fat. Both of these have been the subject of their own recommendations, which we shall now discuss.

Starting with protein, both higher and lower intake have been suggested. Apart from any possible effect on weight loss, more protein in the diet has been advised in the hope that this would stimulate insulin release and improve glucose control <sup>9</sup>.



**There is evidence that increased protein can help glycaemic control, but we lack longer term trials.**

New Study 2 demonstrates just this effect in the very short term. Specific amino acids (such as leucine, arginine, alanine and phenylalanine) do this more strongly than others <sup>10</sup>. A longer trial showed that extra protein significantly reduced glycosylated Hb and lowered glucose response by 40% over 5 weeks. However, we do not have the evidence to show whether adding more protein to diabetic diets will make any practical difference to glucose control over months and years, rather than weeks.

Less protein has been recommended by some to avoid accelerating renal complications <sup>11</sup>. This is supported by some human trials, such as a recent one in which withdrawing meat from the diet reduced albuminuria in type 2 diabetics with macroalbuminuria <sup>12</sup>.

But another RCT involving protein restriction did not show any improvement in renal function over 2 years in diabetics with mild renal failure <sup>13</sup>. The consensus view on this question is that, whilst lowering protein intake (in the range of 0.3-0.8 gm/kg) does slow the progression of diabetic nephropathy, there is no reason to restrict protein in diabetics without clear renal indications to do so <sup>1,14-16</sup>.

Turning to fat, there was a trend at one stage to advise diabetics to consume more fat so as to allow for lower CHO. But the trend in recent years has definitely been towards a decrease, to lessen the hyperlipidaemia, heart disease and other microvascular complications that diabetics are so prone to <sup>7</sup>.

When it comes to limits on consumption of saturated fat and cholesterol, such advice is not in dispute <sup>1,11</sup>. But recently interest has shifted to whether more poly- or monounsaturated fat might actually improve diabetic control, along with its beneficial impact on lipids and possibly on blood pressure <sup>7,17</sup>. A meta-analysis conducted 10 years ago on this very question found some data to support the notion <sup>17</sup>, but overall the evidence is so far not strong enough to be conclusive <sup>1,7</sup>. That is also true of the specific impact of fish oil on glycaemic control <sup>18</sup>.

*Next issue we turn our attention to dietary advice on CHO intake, including fibre and glycaemic index.*

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