

## RISCK Paper Sheds New Light on Dietary Recommendations for Good Heart Health

A new study led by the Medical Research Council (MRC), in collaboration with 4 UK universities (Kings College London, University of Reading, Imperial College London and University of Surrey) has shed new light on dietary recommendations for good health. It has shown that people who replace saturated fat in their diet with low GI carbohydrates or monounsaturated fat (MUFA) are able to improve their blood lipid profile to reduce the risk of cardiovascular disease but there was no clear change in insulin sensitivity.

The study funded by the Food Standards Agency, was conducted by the RISCK\* study group. It involved 720 people, of which 549 completed the trial. The participants were all known to be at an increased risk of cardiovascular disease and were randomly assigned to one of five different diet plans. All participants followed a reference diet for one month to ensure that everyone had a similar starting point and then followed an allocated diet. One group continued with the reference diet for the remaining six months. Two of the diet groups were provided with foods that, although relatively high in fat, had around a third of the saturated fat component (SFA) replaced predominately with monounsaturated fat (MUFA). The remaining two groups reduced the SFA in their diet decreased by replacing the energy with carbohydrate. Within the high MUFA groups and the high carbohydrate groups, half were provided with carbohydrate-rich foods that either had a high or low glycaemic index (GI). GI is a measure of the rate the food releases its energy into the bloodstream.



The researchers used a very detailed measure of insulin sensitivity, but found that insulin sensitivity was not altered with any of the dietary manipulations tested. Further sensitivity analyses found tentative evidence that, in the context of a low fat diet (28% energy from fat), reducing the glycaemic index of the carbohydrate component may be associated with modest improvements in insulin sensitivity. However this study found that there was no benefit of low GI carbohydrates in the high MUFA diet, and the researchers do not regard this study as providing any clear evidence of a benefit of low GI diets on insulin sensitivity. In further analyses the researchers found that even small weight losses were associated with measurable improvements in insulin sensitivity.



The study examined the effect of this dietary manipulation on blood lipids (and other CVD risk factors) and confirmed the well established finding that reductions in saturated fat intake result in decreases in total and LDL cholesterol. Interestingly the researchers found that following a low GI diet led to significant further reductions in total and LDL cholesterol.

There were improvements in total and LDL cholesterol across all test diets as a consequence of reducing SFA and some additional benefits associated with consumption of low GI foods. The ratio of total:HDL cholesterol is often considered to be the most important overall measure of CVD risk and in this respect, the greatest improvement in blood lipids was seen in the high MUFA/low GI group.



Dr Susan Jebb, Head of Nutrition and Health Research at the MRC Human Nutrition Research Unit, who led the study, said:

*"The RISCK trial is important because in one study, it has tested the impact of changing the amount and type of fat and carbohydrate in the diet of individual participants to test the effects on their health, using very detailed measurements. It suggests that favourable blood lipid profiles, associated with reductions in CVD risk, can be achieved by reducing saturated fat and substituting this with monounsaturated fat and by substituting high GI carbohydrates for low GI carbohydrates."*

*"Putting this research in the context of other dietary intervention studies suggests that weight control, rather than diet composition, may be the critical element in improving insulin sensitivity. However our results indicate that further research is warranted to investigate the putative benefits of lowering GI on insulin sensitivity"*



In addition to providing information for health professionals and consumers, this study is also important for the food industry as they seek to reformulate their products and introduce new healthier alternatives by minimising saturated fat and substituting this with MUFA or low GI carbohydrate instead.

Diet is known to be an important determinant of cardiovascular disease. Excess calories leading to weight gain and obesity is a well-established contributor, but the nutritional quality of the diet has effects on health which are independent of body weight. For many decades nutrition science has recognised that dietary saturated fat increases blood cholesterol, a known risk factor for heart disease. There is some evidence that saturated fat may also be linked to an increased risk of diabetes. Accordingly, reductions in saturated fat have been advocated by national and international bodies, usually recommending that no more than 10% of dietary energy be derived from saturated fatty acids. However, if energy intake is to be maintained, the energy from saturated fat must be replaced by energy from other sources. Here the evidence is less clear. The RISCK study was specifically designed to provide new evidence to inform dietary recommendations to reduce the risk of cardiovascular disease.



Dietary recommendations rely heavily on evidence from observational studies, where dietary intake is measured in a large group of individuals and their later health is monitored. These studies have tended to show a lower risk of cardiovascular disease among individuals with a higher intake of monounsaturated fatty acids and some evidence of improvements in insulin sensitivity (a risk factor for Type 2 diabetes and heart disease) with diets where the carbohydrate component contains a preponderance of low GI foods. However in these studies it is necessary to use statistical analyses to remove the influence on health of many other differences between individuals. This may include other differences in their dietary habits, physical activity levels, whether or not they smoke or drink alcohol or factors related to their personal circumstances. In the RISCK study and other interventions the influence of these other factors is reduced, or removed, by randomly allocating participants to a certain diet.

Overall CVD is estimated to cost the UK economy £30.7 billion a year, of which around 47% is due to direct health care costs, 27% to productivity losses, and 26% to the informal care of people with CVD (British Heart Foundation Statistics). In 2007 CVD caused around 190,000 deaths in the UK (British Heart Foundation). Diabetes is a leading cause of CVD and 2.6 million people in the UK suffer from diabetes, with 85-95%

being diagnosed with Type 2 diabetes. Type 2 diabetes occurs when the body is still able to make insulin, but it does not make enough, or the insulin produced does not work properly. In the early stages, Type 2 diabetes can be treated with lifestyle changes, following a healthy balanced diet, increasing physical activity, and losing weight if you need to, though as it progresses more specific medical interventions may be required (Diabetes UK).

- \*A study acronym to describe the 5 participating centres: University of Reading, Imperial College London, University of Surrey, MRC Human Nutrition Research, Cambridge and Kings college, London.
- For a copy of the full research paper please go to: <http://www.ajcn.org/cgi/rapidpdf/ajcn.2009.29096v1>

Susan A Jebb, Julie A Lovegrove, Bruce A Griffin, Gary S Frost, Carmel S Moore, Mark D Chatfield, Les J Bluck, Christine M Williams, Thomas AB Sanders, on behalf of the RISCK Study Group

**Effect of changing the amount and type of fat and carbohydrate on insulin sensitivity and cardiovascular risk: the RISCK (Reading, Imperial, Surrey, Cambridge, and Kings) trial**

For more information or to contact the researchers please call 01223 437521 or email [communications@mrc-hnr.cam.ac.uk](mailto:communications@mrc-hnr.cam.ac.uk)