



## Peanuts really benefit health – the evidence mounts up around the world

There is an established and expanding research evidence base for the health benefits of regular peanut and peanut butter consumption as part of a healthy diet.<sup>1</sup> Recent research on healthy eating patterns such as the “Mediterranean diet” reinforces the role of peanuts along with other nutrient dense foods in promoting health and reducing disease risks. This paper describes findings relating to peanut consumption and health which have appeared recently in biomedical journals from research teams around the world. Collectively this work gives more definition to our understanding of peanuts and peanut butter as an important part of a beneficial pattern of eating that is easy to adopt.

### Overall quality of what you eat really matters

Based on the largest meta-analysis ever undertaken of dietary factors in relation to coronary heart disease (CHD), a research team at McMaster University in Canada found a causal link between a small number of dietary factors – nut consumption amongst them - and protection from CHD.<sup>2</sup> Their systematic evidence review had rigorous inclusion criteria: some 200 studies between 1950 and 2007 were reviewed which followed subjects for at least one year. It looked for a cause and effect relationship for various foods and CHD and also at the relationship to CHD risks of eating patterns such as the traditional Mediterranean dietary pattern featuring

fruit and vegetables, whole grains, legumes, nuts, fish, modest amounts of red meat and dairy products and using mainly unsaturated fat from olive oil.

It is well established that peanuts can be identified along with other legumes and nuts in the “Mediterranean pyramid” eating pattern – which groups nuts, legumes, fruit, vegetables, grains, seeds, and olive oil together to form the largest part of the pyramid. This approach to food consumption is increasingly promoted to consumers by health professionals.<sup>3</sup>

The Canadian team’s findings from their meta-analysis singled out vegetables and nuts as well as the Mediterranean

eating pattern along with unsaturated fatty acids as strongly associated with reduced CHD risk. The evidence also pointed to higher heart disease risks of exposure to “Western” eating patterns featuring a high-glycaemic load from foods containing refined carbohydrates and sugars, as well as saturated fats from red and processed meats and higher fat dairy products and trans-fats. The Mediterranean eating pattern was a convenient way to help consumers avoid these higher risk foods.



#### Inside this issue:

Peanuts really benefit health—the evidence mounts up from around the world	1
Overall quality of what you eat really matters	1
Mediterranean eating pattern + nuts = benefits for people with type 2 diabetes	2
Peanuts and type 2 diabetes—getting risk factors under control	3
Nut consumption to avoid overweight and obesity—more good news for women	4
Nut consumption and blood pressure lowering—good news for men	5
In a peanut shell—it’s the health functionality that matters	5
Conclusion	6

1. King JC et al. “Tree nuts and peanuts as components of a healthy diet”. *Journal of Nutrition* 2008; 138: 1736s-1740s
2. Mente A et al. “A systematic review of the evidence supporting a causal link between dietary factors and coronary heart disease”. *Archives of Internal Medicine* 2009;169(7):659-669
3. Oldways Preservation Trust, *Mediterranean Diet Pyramid* (updated 2008), [www.oldwayspt.org/med\\_pyramid.html](http://www.oldwayspt.org/med_pyramid.html) accessed 14-5-09; Antinoro L. “Mediterranean eating: a myriad of benefits” [www.intelihealth.com/IH/ih/IH/WSIHW000/35320/35327/1008054.html?d=dmthMSContent](http://www.intelihealth.com/IH/ih/IH/WSIHW000/35320/35327/1008054.html?d=dmthMSContent) accessed 19-5-09

## Mediterranean eating pattern + nuts = benefits for people with type 2 diabetes

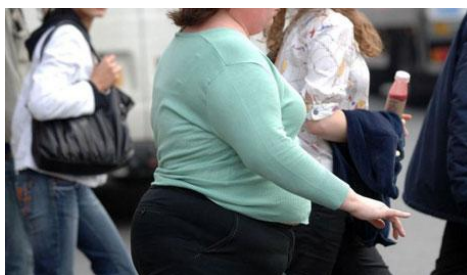
The McMaster review reaffirms the position of peanuts as part of a beneficial eating pattern strongly represented in the “Mediterranean pyramid”. Having a very low glycaemic index means that including peanuts in this eating pattern helps keep the overall glycaemic load of meals and snacks low as well. The fat in peanuts is also overwhelmingly unsaturated, containing the same predominant monounsaturated oleic acid as found in olive oil.



A significant recent finding supporting the Mediterranean eating pattern including nuts in terms of managing the metabolic syndrome (a collection of risk factors for heart disease and type 2 diabetes including abdominal obesity, high cholesterol, hypertension and

raised blood glucose) comes from a large (1224 participants aged 55 to 80 at high risk of heart disease) Spanish study linked to the well known PREDIMED (“PREvencion con Dieta MEDiterranea”) Study.<sup>4</sup> Comparing the impact of two versions of the Mediterranean diet - one enriched with virgin olive oil and the other enriched with 30g of nuts per day – with a low fat diet on metabolic syndrome symptoms, the Spanish investigators found after one year that metabolic syndrome symptoms decreased 13.7% in the nuts group, 6.7% in the olive oil group and 2% in the low fat diet (control) group.

There was no change in weight, but a significant drop in the numbers of participants with large waists, high blood fats (triglycerides) or hypertension in the Mediterranean diet plus nuts group compared with controls.



*Peanuts included as part of a 1200KCal controlled diet*

The Spanish researchers suggested that nuts might have achieved this effect by reducing oxidative damage to cells, reducing chronic inflammation leading to atherosclerosis and lowering insulin resistance as well as providing additional fibre, arginine (an amino acid linked to the production of nitric oxide which is known to relax the walls of blood vessels), as well as potassium, calcium and magnesium. As the PREDIMED Study produces more findings with longer follow up periods, the benefits of diets enriched with nuts for cardiovascular health are likely to be demonstrated strongly.

4. Salas-Salvado J et al. “Effect of a Mediterranean diet supplemented with nuts on metabolic syndrome status: one year results of the PREDIMED randomized trial” *Archives of Internal Medicine* 2008; 168(22): 2449-2458

## Peanuts and type 2 diabetes – getting risk factors under control

At the April 2009 Experimental Biology Conference, researchers from the University of Toronto presented findings demonstrating the role peanuts and other nuts may play in the dietary management of Type 2 diabetes, a global and rapidly growing health problem, by improving blood lipid levels and possibly reducing blood glucose levels. According to these Canadian researchers, this was the largest study to date looking at the effect of tree nuts and peanuts on Type 2 diabetes.<sup>5</sup> They found that study subjects with established diabetes receiving the “full dose nut diet” - consisting of raw nuts added to the usual diet based on required energy intake, ie someone consuming between 1,660-2,400 kcal/day received 75g/day of nuts or about 450kcal - reported the best outcomes in terms of haemoglobin A1c (HbA1c) levels which is used to estimate the management of blood sugar (glucose levels). They also benefited from a significant decrease in cardiovascular risk factors such as total cholesterol and LDL cholesterol. Lead research Dr Cyril Kendall of Toronto University said *“these findings build upon previous research which has found that nuts have a beneficial role in impacting serum lipid levels and also suggest that nuts may have value in promoting glycemic control.”*

This Canadian study underlined

findings released in 2008 from Chinese researchers about the beneficial effects for the prevention of type 2 diabetes of diets featuring peanuts and other legumes, which are all good fibre sources having a low glycemic index.<sup>6</sup> Studying the dietary intake of almost 75,000 middle-aged women in urban Shanghai through personal interviews and food-frequency questionnaires between 1997 and 2002, investigators were able to demonstrate the positive impact of peanuts, other legumes and soy



foods on a reduced risk of type 2 diabetes. They found a specific inverse association between peanut consumption and diabetes risks, which bears out the findings of the US Nurses' Health Study II which found that consumption of both peanuts and peanut butter was protective against the development of this form of diabetes, which is

rapidly becoming one of the most significant metabolic diseases around the world.<sup>7</sup> The Shanghai study's authors concluded that *“Peanuts may have a protective effect on type 2 diabetes because of their high content of polyunsaturated fatty acids, which has been shown to be associated with insulin sensitivity and antioxidants, fiber and magnesium, which have been shown to be associated with a lower risk of type 2 diabetes. Nut consumption has also been shown to be associated with a lower risk of coronary heart disease.”*

While better prevention of type 2 diabetes is essential, it has to be acknowledged that increasing numbers of people around the world already have type 2 diabetes, though many have yet to be diagnosed. For them the need is for optimal dietary management of their condition and avoidance of complications such as heart disease and other circulatory problems. For women with type 2 diabetes there was recently good news about the benefits of regular nut and peanut butter consumption from an extensive study by a Harvard university team looking at lower risks of cardiovascular disease in this group.<sup>8</sup> A large sample size (6,309 women) and long follow up period (an average period of 12 years to June 2002) made this a very powerful study whose central finding was

5. Kendall C et al. “Longer-term effects of a low glycemic index diet on glycemic control in Type 2 diabetes” 2009 Experimental Biology meeting abstracts, Abstract #563.30; accessed 30-4-09; *FASEB Journal* 2009; 23:563.30
6. Villegas R et al. “Legume and soy food intake and the incidence of type 2 diabetes in the Shanghai Women's Health Study” . *American Journal of Clinical Nutrition* 2008; 87: 162-167
7. Jiang R et al. “Nut and peanut butter consumption and risk of type 2 diabetes in women.” *Journal of the American Medical Association* 2002; 288(20): 2554-2560
8. Li TY et al. “Regular consumption of nuts is associated with a lower risk of cardiovascular disease in women with type 2 diabetes” . *Journal of Nutrition* 2009; 139(7): 1333-1338

that “frequent nut and peanut butter consumption of at least 5 servings per week was associated with a significantly lower risk of cardiovascular disease and myocardial infarction among women with type 2 diabetes.”<sup>9</sup> The Harvard investigators also found lower blood lipid markers such as LDL cholesterol for

heart disease and diabetes in this group. This all contributed to a lower risk of cardiovascular disease and heart attacks - some 44% - amongst the frequent nut and peanut butter consumers. As in the Shanghai study discussed above, the Harvard researchers identified a number of potential mechanisms

through which peanuts and peanut butter consumption could produce a cardio-protective effect, including: decreasing lipoprotein oxidation, reducing inflammation in blood vessels, decreasing insulin resistance, and improving endothelial function (the elasticity of blood vessel walls).

## Nut consumption to avoid overweight and obesity—more good news for women

Overweight and obesity are frequently associated with other factors in the development of type 2 diabetes and other disorders, but a growing evidence base shows that frequent nut consumption as part of a healthy diet does not pose a risk of significant weight gain or obesity in normal weight individuals. Another 2009 Harvard University study of the relationship between nut consumption and long term weight change in the 51,000 participants in the Nurses’ Health Study II aged between 20-45 showed that during the 1990s those women eating peanuts, peanut butter or tree nuts more than twice a week had less weight gain than women who did not eat them, as well as a lower risk of obesity during the eight years they were followed up.<sup>10</sup> The Harvard investigators found that peanut butter was more frequently consumed than plain nuts: 43% ate peanut butter at least weekly and 22% consumed it at least twice a week. Higher total nut consumption was associated with lower

BMI (body mass index) over the eight year study. They concluded, “among normal weight women, there was a significant trend toward less weight gain for women who consumed nuts more frequently ... [and] ... when we assessed peanut butter consumption, we found no evidence of an association with obesity.”



Among the mechanisms proposed to explain the lack of weight gain in the frequent nut eaters, the Harvard team singled out the high satiety effects due to protein and fibre content of peanuts and peanut butter which suppress hunger, along

with nuts’ largely unsaturated fat energy density. The researchers considered that high protein, fibre and unsaturated fat content “may lead to an overall increase in diet induced thermogenesis and in resting energy expenditure which potentially contributes to weight maintenance.”

Their conclusion also stressed a key health promotion message about the importance of food replacement to avoid adding extra calories. This concept, they said, “should be addressed in messages addressed to the general population to avoid the mistaken interpretation of consuming nuts in addition to the usual daily caloric intake. Health professionals should recommend that nut consumption replace the consumption of other unhealthy snacks or desserts....”



9. Serving sizes were 28g (1 oz) for nuts; 16g (1 tablespoon) for peanut butter
10. Bes-Rastrollo M et al. “Prospective study of nut consumption, long-term weight change, and obesity risk in women”. *American Journal of Clinical Nutrition* 2009; 89: 1-7

## Nut consumption and blood pressure lowering—good news for men

The well-researched Dietary Approaches to Stop Hypertension (DASH) eating plan can have a beneficial effect on reducing blood pressure.<sup>11</sup> DASH features increased consumption of fruit and vegetables, low fat dairy products, whole grains, fish, and lean poultry as well as peanuts, peanut butter and other legumes, nuts and seeds (4-5 servings per week) while reducing saturated fat products and refined carbohydrates. Further confirmation of the role nut consumption can have in reducing hypertension risks comes from a recently published prospective cohort study of almost 16,000 American physicians representing 237,585 person-years of follow up.<sup>12</sup> Nine in 10 adults are likely to develop hypertension by the age of 65, so lowering blood pressure is an important way to help reduce risks of stroke, heart attack and

heart failure and chronic kidney disease.<sup>13</sup>

The Harvard research team leading this part of the Physicians' Health Study found a lower incidence of hypertension associated with more frequent nut consumption among middle-aged US male doctors, particularly among those who were not overweight. They analysed self-reported questionnaires about nut consumption which did not discriminate between the types of nuts consumed, so it is reasonable to assume that peanuts were a significant part of the nuts eaten by the study subjects because peanuts are the most commonly consumed "nut" in the United States.<sup>14</sup>

The physiologic mechanisms underlying the relationship between higher nut consumption and lower blood pressure described by the research-



ers included: low sodium, unsaturated fatty acids, magnesium, potassium, fibre, antioxidants and various vitamins found in nuts. In synergy, these were able to exert a beneficial influence on blood pressure through various means, including inhibiting inflammation and preventing atherosclerosis in blood vessels.

## In a peanut shell—it's the health functionality that matters



The evidence for the protective effects of peanuts and other nuts

from both clinical and epidemiologic studies is compelling and still expanding.<sup>15</sup> The new studies mentioned in this paper reflecting major research efforts in Europe, China, and North America add to the evidence base about the benefits of frequent long term peanut and nut consumption in terms of lower risks

of obesity and common diseases such as type 2 diabetes and coronary heart disease.

Emerging research is also taking the heart health story in particular well beyond cholesterol lowering into the realm of understanding a range of bioactive macro- and micronutrients which are plentiful in

11. USDHHS, National Institutes of Health. *Lowering Your Blood Pressure with DASH* (revised edition 2006) [www.nhlbi.nih.gov/health/public/heart/hbp/dash/new\\_dash.pdf](http://www.nhlbi.nih.gov/health/public/heart/hbp/dash/new_dash.pdf) accessed 26-5-09
12. Djousse, L et al. "Nut consumption and risk of hypertension in US male physicians." *Clinical Nutrition* 2009; 28: 10-14.
13. Vasan RS et al. "Residual lifetime risk for developing hypertension in middle-aged women and men: the Framingham Heart Study." *Journal of the American Medical Association* 2002; 287: 1003-1010
14. 68% of total nut consumption in the United States is peanuts and peanut butter. USDA Center for Nutrition Policy and Promotion. "The role of nuts in a healthy diet". *Insight* 2000; 23:1-2
15. Sabate J, Ang Y. "Nuts and health outcomes: new epidemiologic evidence." *American Journal of Clinical Nutrition* 2009; 89 (suppl): 1643S-1648S

peanuts.<sup>16</sup> A dietary pattern that includes nuts - the Mediterranean eating pattern – capable of being adapted to a range of settings, has been consistently related to beneficial health outcomes, thus providing more evidence of the positive impact of nut consumption as part of a healthy lifestyle.

This is an accumulation of evidence having considerable public health implications that has happened in less than 20 years since the first publication in 1992 on epidemiological observations about nuts and

health.<sup>17</sup> The task now is to interpret the evidence in messages which health professionals and the food industry can convey to consumers and to make products and consumption suggestions accessible for consumers. The American Dietetic Association's (ADA) new position statement on *Functional Foods* shows a way forward for getting this message to consumers. The ADA points out that conventional foods such as nuts, tomatoes, kale, broccoli and berries are essentially unmodified foods with no or minimal proc-

essing which consumers should see as "functional foods" by virtue of their physiologically active components which have demonstrable beneficial properties, mainly in disease risk reduction and optimizing health.<sup>18</sup> The ADA argues that "*functional foods that include whole foods ... have a potentially beneficial effect on health when consumed as part of a varied diet on a regular basis, at effective levels.*" The evidence shows that peanuts fit this definition of health functionality very well.

## Conclusion

The evidence for the role of peanuts and peanut butter as a key part of a beneficial eating pattern continues to mount from research undertaken around the world. It is clear that incorporating frequent consumption of peanuts, peanut

butter and other nuts into our everyday healthy eating habits can have big payoffs in terms of disease risk reduction. This includes prevention of major diseases for the general population and better management and outcomes for those individuals

with established conditions such as type 2 diabetes. Inexpensive, tasty, versatile and nutritious, peanuts are truly one of Nature's original functional foods which really benefit health.



16. Ros E. "Nuts and novel biomarkers of cardiovascular disease". *American Journal of Clinical Nutrition* 2009; 89(suppl): 1649S-1656S
17. Kris-Etherton PM et al. "The role of tree nuts and peanuts in the prevention of coronary heart disease : multiple potential mechanisms". *Journal of Nutrition* 2008; 138 (suppl): 1746S-1751S
18. "Position of the American Dietetic Association: functional foods." *Journal of the American Dietetic Association* 2009; 109; 735-746



The American Peanut Council (APC) is the trade association which represents all segments of the American peanut industry. Members include peanut growers, peanut shellers, brokers, peanut product manufacturers, and suppliers of goods and services to the industry. The APC is a non-profit making organization and does not buy or sell peanuts or peanut products.

Headquartered in Alexandria, Virginia, USA (close to Washington DC), the APC monitors developments in the domestic and international markets and responds with a diverse array of domestic and international marketing, trade servicing, research and issues management programmes. The APC maintains close working relationships with government agencies, research institutions and related peanut and agricultural trade associations.

#### American Peanut Council

Rooms 157-159  
Grosvenor Gardens House  
35-37 Grosvenor Gardens  
LONDON SW1W 0BS  
United Kingdom

Phone: +44 (0) 207 828 0838

Fax: +44 (0) 207 828 0839

E-mail: [lmckerchar@peanutsusa.org.uk](mailto:lmckerchar@peanutsusa.org.uk)



[www.peanutsusa.org.uk](http://www.peanutsusa.org.uk)