GREAT BRITISH APPLES HEALTH RESEARCH REVIEW

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The adage "an apple a day keeps the doctor away" allegedly originates from Pembrokeshire in 1860. More recently the medical profession has examined the relationship between apple intake and health. The most robust evidence is derived from a meta-analysis - where studies are graded for how well they were conducted, and the weighted average result is calculated.

This health research review collates the strongest and most recent literature to provide a robust analysis on the health benefits of the Great British apple.

Fibre

In terms of nutritional content (1) (Table 1), current food labelling legislation permits a nutrient claim for dietary fibre, with apples containing 1.2g dietary fibre per 100g. Dietary fibre contributes to increasing faecal bulk and transit time, and higher intakes are associated with lower risks of cardiovascular, type 2 diabetes and colorectal cancer.

Gut Health

Emerging research suggests that a more diverse gut microbiota may promote health and help regulate appetite. Eating apples may contribute to this process by encouraging the growth of more "friendly" bacteria in the large bowel (2).

Cardiovascular Disease

Meta-analyses (3) show that eating more fruit, especially apples, is associated with a lower risk of cardiovascular disease, both stroke and heart attack and all-cause mortality. When the analysis is broken down to look at the type of fruit consumed, apples and pears, citrus fruits and grapes appear to be consistently protective: citrus fruits are high in vitamin C and apples, pears and grapes are much richer in polyphenols (compounds that have antioxidant and other potential health promoting effects).

Polyphenols

Polyphenols are biologically active compounds found in plant-based foods, including apples. Polyphenols have antioxidant properties that help mop up harmful chemicals called free-radicals. It is believed that certain polyphenols, when consumed in foods as opposed to supplements, may contribute to a lower risk of developing type 2 diabetes and cardiovascular disease. In the case of diabetes, it is believed polyphenols may help protect the pancreatic beta-cells that produce insulin from damage by free-radicals. In relation to cardiovascular disease, polyphenols are believed to help protect endothelial cells that line the blood vessels from damage by free-radicals.

Diabetes

The current obesity epidemic is resulting in a sharp rise in the prevalence of type 2 diabetes. Due to their sweet taste, apples might seem quite high in sugar but when you eat a whole apple it results in a much smaller rise in blood sugar than apple juice (5). This is because the sugar is released more slowly from the apple. Apples also contain polyphenols which are associated with a lower risk of type 2 diabetes. Consequently, apples are recommended as suitable for people with diabetes and eating apples and other foods rich in polyphenols regularly may also help prevent type 2 diabetes (6, 7).

Official guidelines

Public Health England recommends that we eat five portions of fruit and vegetables a day which is more than the current intake of 4.2 portions per day. Some studies (3) have suggested that 7 or even 10 portions a day might be better, though others infer three portions could be enough (8). It is well known that people over-estimate their intake of fruit and vegetables when answering questionnaires and individuals are often confused as to what constitutes a portion. The Department of Health assumes each portion of fruit and vegetables is 80g - giving a total of 400g a day. One recent recommendation suggests consuming 500g a day - which is closer to six portions (8). An apple provides one healthy portion contributing towards our recommended daily fruit and vegetable intake.

Prevention of obesity is a major priority for everyone, including children. The Chief Medical Officer at the Department of Health has highlighted how mindless snacking on high energy food is one way in which people can easily overconsume calories. Snack foods such as crisps

and cereal bars typically provide at least 150 kcal/serving whereas swapping these for an apple is a healthier choice providing about 50 kcal/100g.

Sustainability

Recently, attention has focused on recommending diets that are not only healthier but can be grown locally and do not have adverse effects on climate change (9). The range of climate conditions we experience in different parts of the country makes the UK an ideal environment for growing apples. Some varieties like plenty of sunshine, while others can withstand colder temperatures – with our climate providing the optimal environment for apples to ripen more slowly. Consequently, choosing a British apple for a snack is also in line with how to select a diet that is more sustainable and better for the planet.

References

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Table 1. The nutritional composition of an eating apple.

	Nutrient/100g	reference value*	% reference value**
Water g	86.2		
Energy kcal	51	2000	3%
Protein g	0.6	50	1%
Fat g	0.3	70	0%
Carbohydrate g	11.6	260	4%
Sugars g	11.5	90	13%
Glucose g	2.1		
Fructose g	6.7		
Sucrose g	2.8		
Non-starch polysaccharides g	1.3	18	7%
Dietary fibre g	1.2	30	4%
Potassium mg	100	2000	5%
Calcium mg	5	800	1%
Magnesium mg	4	375	1%
Iron mg	0.1	14	1%
Copper mg	0.03	1	3%
Manganese mg	trace	2	0%
Zinc mg	trace	10	0%
Vitamin A r.e.	2.3	800	0%
Vitamin D μg	0	5	0%
Vitamin E mg	0.09	12	1%
Thiamin mg	0.04	1.1	4%
Riboflavin mg	0.04	1.4	3%
Niacin mg	0.1	16	1%
B6 mg	0.07	1.4	5%
Folate μg	trace	200	0%
Pantothenic acid mg	0.1	6	2%
Biotin μg	1.1	50	2%
Vitamin B12 μg	0	0	0%
Vitamin C mg	6	80	8%

Data from Finglas PM et al. (2015). McCance and Widdowson's The Composition of Foods.
* Reference Values are used on food labels as defined by the EU Regulation No. 1169/2011 on the provision of food information to consumers (EU FIC). They are benchmarks on which to compare foods and not recommended intakes. They can be expressed either as per 100g

food or per portion. This review uses 100g as apples vary in size. A large apple is typically around 135g and a small apple about 80g as used in NHS guidance.

** % Reference Value is a percentage of the reference value as stated. It is what consumers routinely see on food labels. Claims for vitamins and minerals are only allowed if the contribution is more than 15% of the reference value. For an explanation see the food labelling regulation guidance https://www.gov.uk/food-labelling-and-packaging/nutrition-health-claims-and-supplement-labelling