



# Health Benefits of Apple with Special Reference to Kashmiri Apple

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**Abstract :** This research paper investigates the extensive health advantages linked to the consumption of apples (*Malus domestica*, *Borkh. Family: Rosaceae*), with a specific focus on the unique qualities of Kashmiri apples. It thoroughly examines the detailed nutritional composition of apples, clarifying their crucial function in preventing diseases and investigating how they affect digestive well-being. Additionally, the paper considers potential factors that merit attention, offering practical recommendations for seamlessly incorporating apples into a well-rounded diet. Furthermore, it outlines pathways for future research in this field, aiming to contribute to a more comprehensive understanding of the health benefits associated with apple consumption.

**IndexTerms - Apples, Nutritional Benefits, Health Promotion, Disease Prevention, Bioactive Compounds, Polyphenols, Flavonoids, Dietary Fibers, Chronic Diseases.**

## Introduction:

Apples, revered as a symbol of temptation and vitality in ancient folklore and mythology, have entrenched themselves as one of the most beloved fruits worldwide. With their tantalising blend of sweetness and crunch, apples transcend mere culinary delight to offer a plethora of health-enhancing properties. The consumption of apples has been entwined with human history for millennia, featuring prominently in traditional medicine systems and dietary practices across cultures. While the folklore surrounding apples often focuses on their mythical allure, modern scientific inquiry has unveiled the profound nutritional richness and health benefits embedded within this humble fruit.

## Nutritional Value of Apples:

Apples boast a remarkable nutritional profile. A medium-sized apple contains approximately 95 calories, providing a mix of dietary fibre, vitamins, minerals, and antioxidants. The dietary fibre in apples, both soluble and insoluble, plays a crucial role in supporting digestive health and overall metabolic function.

- Calories: 94.6
- Water: 156 grams
- Protein: 0.43 grams
- Carbs: 25.1 grams
- Sugar: 18.9 grams
- Fiber: 4.37 grams
- Fat: 0.3 grams [1]

Apples are mainly composed of carbs and water. They're rich in simple sugars, such as fructose, sucrose, and glucose.

Despite their high carb and sugar contents, their glycemic index (GI) is low, ranging 29–44.

The GI is a measure of how food affects the rise in blood sugar levels after eating. Low values are associated with various health benefits. Due to their high fiber and polyphenol counts, fruits often have a low GI score.[2]

## Fiber Content:

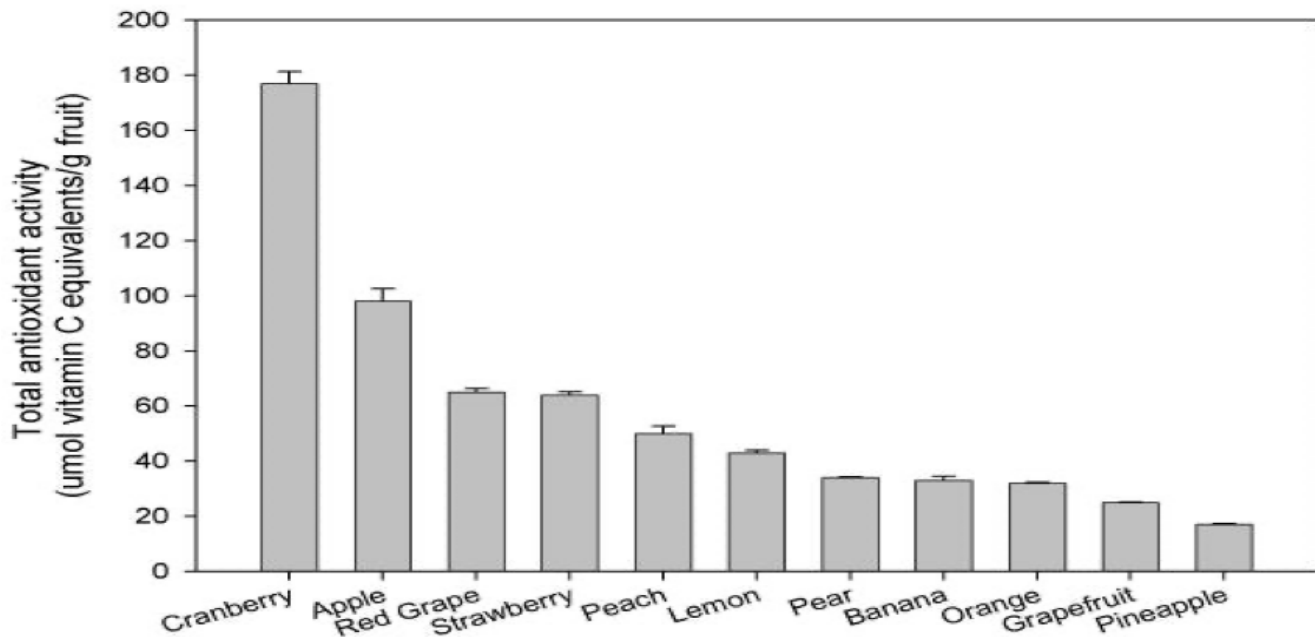
Apples are an excellent source of dietary fibre, with an average of 3 grams per medium-sized apple.[3] The soluble fibre, pectin, not only aids in digestion but also contributes to satiety, making apples a valuable component of weight management and dietary regulation.

## Vitamins and Minerals:

Apples contain essential vitamins and minerals, including Vitamin A (6mcg) vitamin C (9.2mg), potassium (214mg), sodium (2mg) and various B vitamins.[4] Vitamin C, known for its antioxidant properties, contributes to immune function and skin health. Potassium, a vital electrolyte, plays a role in maintaining blood pressure and cardiovascular health.

**Antioxidants:**

The antioxidants in apples, such as flavonoids and polyphenols, contribute to their vibrant colour and provide numerous health benefits. These compounds help combat oxidative stress and inflammation, potentially reducing the risk of chronic diseases.[5]

**Health Benefits:**

Consuming apples is associated with a plethora of health benefits that extend beyond basic nutrition. Scientific studies and epidemiological evidence highlight several key areas of health improvement linked to regular apple consumption.

**Cardiovascular Health:**

Consuming apples has been linked to a lower risk of cardiovascular disease, as evidenced by findings from various studies. For instance, the Women's Health Study observed almost 40,000 women over 6.9 years and discovered that those with the highest intake of flavonoids experienced a 35% decrease in cardiovascular events. Interestingly, flavonoid intake wasn't connected to the risk of stroke, heart attacks, or cardiovascular disease-related deaths.[6]

In a Finnish study focusing on flavonoid intake and coronary mortality, it was found that women who consumed more flavonoids had a lower risk of coronary mortality. This was especially notable in those who consumed apples and onions.[7] Similarly, a study in Iowa involving postmenopausal women revealed that apple and wine consumption were inversely related to death from coronary heart disease. Catechin and epicatechin, present in apples, were strongly associated with decreased risk of coronary heart disease death.[8]

Furthermore, the Zutphen Elderly Study examined the connection between flavonoids and coronary heart disease in elderly men, finding that flavonoid intake was linked to reduced mortality from heart disease and myocardial infarction.[9] Tea, a major source of flavonoids, also showed a negative correlation with coronary heart disease. Although apple intake contributed significantly to flavonoid intake, its association with reduced risk of death from coronary heart disease in men was not statistically significant.

**Weight Management:**

The high fiber content in apples contributes to a feeling of fullness, promoting satiety and potentially aiding in weight management. Including apples in a balanced diet may help individuals control their caloric intake and make healthier food choices. Further, fiber slows down digestion, promoting a sensation of fullness and reducing the likelihood of overeating. Consuming fiber-rich foods can aid in managing symptoms and mitigating the impact of acid reflux. Additionally, the fiber found in apples can assist with both diarrhea and constipation.[10]

Moreover, certain plant compounds and the fiber present in apple peels have been indicated in studies to offer protection against damage to blood vessels and the heart. They may also contribute to lowering cholesterol levels and potentially safeguarding cellular DNA from oxidative damage, a factor associated with the development of cancer.

**Disease Prevention:**

Apples have been associated with a lower risk of certain chronic diseases. The antioxidants present in apples, particularly *quercetin*, have demonstrated potential in reducing the risk of certain cancers and protecting against neurodegenerative disorders.[11]

**Digestive Health:**

The human intestinal tract harbours a diverse array of microorganisms, with about  $10^{12}$  microbial cells per gram of gut content and around 1000 distinct species[12]. Dietary choices can influence the composition and behavior of these gut microorganisms. The quality and quantity of nutrients that reach the colon significantly impact the makeup and function of the microbiota. Dietary fiber, a primary substrate for fermentation in the colon, plays a crucial role in warding off chronic diseases like type 2 diabetes, cardiovascular issues, obesity, and certain cancers. Notably, a significant portion of dietary plant *polyphenols*, such as those found in apples, remains intact as they reach the colon. This interaction between *polyphenols* and gut bacteria is bidirectional, with commensal bacteria metabolising polyphenols into simpler compounds, while polyphenols themselves can modulate the composition of the gut microbiota, inhibiting some bacterial strains while promoting others. In a small-scale intervention study involving eight participants, consuming two apples daily for two weeks led to a notable increase in beneficial *bifidobacteria* in faecal matter, while decreasing harmful *Enterobacteriaceae* and *clostridia*, including *C. perfringens*[13]. There was also a tendency for higher levels of *Lactobacillus*, *Streptococcus*, and *Enterococcus*. Apples play a pivotal role in supporting digestive health. Their fiber content, encompassing both soluble and insoluble fibers, aids in regular bowel movements and mitigates constipation. Additionally, the prebiotic properties of apple fiber contribute to a balanced and healthy gut microbiota.

**Antioxidant Properties:**

The antioxidants present in apples provide a robust defence against oxidative stress. Oxidative stress is linked to the development of chronic diseases and the aging process. Regular consumption of apples may contribute to cellular health and longevity. Using exogenous antioxidants to supplement endogenous antioxidants and compensate for any depletion in their levels or functions is a common approach to enhance the overall cellular antioxidant defense system. Obtaining antioxidants from dietary sources like fruits, vegetables, and herbs, which are rich in polyphenols, carotenoids, and vitamins, is crucial for this supplementation. Apples, abundant in polyphenols, are highlighted for their antioxidant properties, supported by positive associations between polyphenol concentrations and antioxidant capacities. Polyphenols encompass various antioxidant groups, each operating at different levels of antioxidant activity based on their chemical structures. Their possession of aromatic rings, a conjugated system, and numerous hydroxyl groups are essential for neutralising ROS by donating electrons or hydrogen atoms and chelating oxidative metals through various proposed mechanisms.[14] Additionally, polyphenol supplementation is reported to enhance the activities of SOD, CAT, and GPx enzymes by triggering the nuclear factor erythroid-related factor-2 (Nrf2) signalling pathway in response to ROS. Apples are rich in flavonoids and polyphenols, which have been studied for their antioxidant and anti-inflammatory properties. These compounds may play a role in preventing cellular damage and reducing the risk of diseases associated with chronic inflammation.

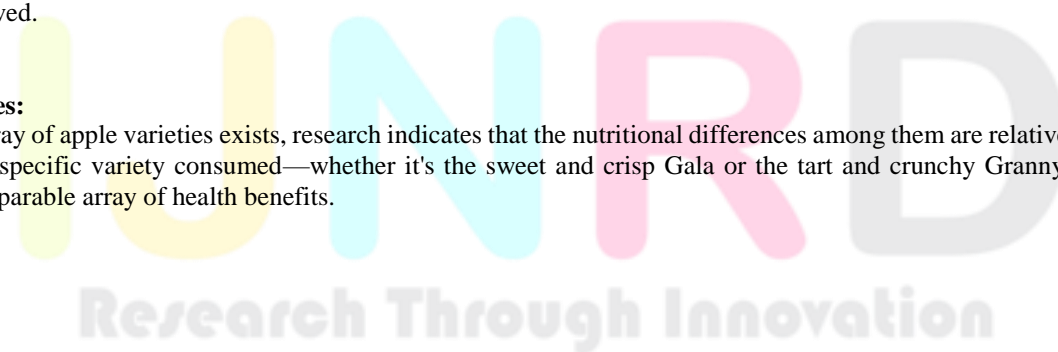
**Blood Sugar Regulation:**

Apples have shown promise in regulating blood sugar levels, making them a suitable choice for individuals with diabetes or those at risk of developing the condition. The fibre content, combined with the presence of certain polyphenols, may contribute to improved insulin sensitivity.

Apples contain sugar, predominantly in the form of fructose. When consumed as part of the whole fruit, fructose has little impact on blood sugar levels. The fiber present in apples further slows down the digestion and absorption of sugar, resulting in a gradual release into the bloodstream, which prevents a rapid increase in blood sugar levels. Additionally, the polyphenols present in apples may contribute to slowing down carbohydrate digestion and reducing blood sugar levels. As a result, apples have low scores on both the glycemic index (GI) and glycemic load (GL) scales, indicating that they are unlikely to cause significant spikes in blood sugar levels.[15] Further, studies have suggested that the polyphenols in apples, such as phloridzin, may enhance insulin sensitivity, potentially helping individuals better manage their blood sugar levels. However, further research is needed to fully understand the mechanisms involved.

**Varieties of Apples:**

While a diverse array of apple varieties exists, research indicates that the nutritional differences among them are relatively minimal. Regardless of the specific variety consumed—whether it's the sweet and crisp Gala or the tart and crunchy Granny Smith—all apples offer a comparable array of health benefits.





## Delightful Kashmiri Apples: A Treasure from the Valley



Kashmiri apples are renowned for their exceptional taste, juiciness, and delicate texture, originating from the Valley of Kashmir. Compared to other apples, they boast a paler shade of red, adding to their distinct appeal.[16]

### Varieties and Characteristics

Among the varieties, *Ambri* stands out, known for its high keeping quality and sought-after attributes such as sweetness, crispness, and fragrant aroma.[17] These apples have found a secure place in the valley's agricultural landscape, thriving in its unique agro-climatic conditions. Varieties like *Dodhi Ambri*, *Chari Ambri*, *Walayati Ambri*, and *Mah Ambri* are among the favourites commercially grown by local growers.[18]

### Health Benefits of Kashmiri Apples

Kashmiri apples are not just a treat for the palate but also offer an array of health benefits:

#### Rich in Vitamin C:

Similar to other apple varieties, Kashmiri apples are rich in vitamin C, vital for boosting immunity, supporting cell protection, and aiding collagen production for healthy skin and hair.

#### High in Dietary Fiber:

These apples are a valuable source of dietary fiber, crucial for digestive health. Fiber regulates blood sugar levels, promotes satiety, and assists in weight management.

#### Antioxidant Power:

Loaded with antioxidants, Kashmiri apples safeguard cells from free radical damage, potentially lowering the risk of chronic diseases such as heart disease, cancer, and stroke.

#### Potassium-Rich:

Kashmiri apples provide a good dose of potassium, essential for maintaining healthy blood pressure and muscle function.

#### Cholesterol Management:

Studies hint at the cholesterol-lowering potential of apples, likely attributed to their pectin content. Pectin, a soluble fiber, may bind to cholesterol in the digestive tract, impeding its absorption into the bloodstream.

While these benefits underscore the nutritional value of Kashmiri apples, further research is warranted to validate and elucidate their mechanisms fully. Nevertheless, with their delectable taste and wholesome qualities, Kashmiri apples undoubtedly make a delightful addition to any balanced diet.

### Conclusion:

Apples emerge as a nutritional powerhouse, offering a diverse range of health benefits that extend beyond basic sustenance. Their rich nutritional profile, coupled with disease-fighting antioxidants and digestive support, positions apples as a valuable addition to a health-conscious diet.

### Recommendations:

Integrating apples into a daily dietary regimen is a practical and enjoyable way to enhance overall health. Recommendations include snacking on fresh apple slices, incorporating apples into salads, or blending them into nutritious smoothies.

### Future Research Directions:

Despite the wealth of knowledge on the benefits of apples, several avenues for future research exist. Investigating specific bioactive compounds responsible for health benefits, exploring the impact of apple consumption on different age groups, and conducting long-term intervention studies are areas that warrant further exploration.

### References:

- [1] <https://www.healthline.com/nutrition/foods/apples#nutrients>
- [2] *ibid.*
- [3] <https://www.hsph.harvard.edu/nutritionsource/food-features/apples/>
- [4] <https://www.verywellfit.com/apples-nutrition-facts-calories-and-their-health-benefits-4117992>
- [5] Jeanelle Boyer and Rui Hai Liu, Apple phytochemicals and their health benefits, , 2004,
- [6] Sesso H, Gaziano JM, Liu S, Buring J. Flavonoid intake and risk of cardiovascular disease in women. *Am J Clin Nutr.* 2003;**77**:1400–1408.
- [7] Knekt P, Jarvinen R, Hakkinen R, Reunanen A, Maatela J. Flavonoid intake and coronary mortality in Finland: a cohort study. *BMJ.* 1996;**312**:478–481.
- [8] Arts I, D. J, Harnack L, Gross M, Folsom A. Dietary catechins in relation to coronary heart disease among postmenopausal women. *Epidemiology.* 2001;**12**:668–675. doi: 10.1097/00001648-200111000-00015.
- [9] Willett W. Balancing life-style and genomics research for disease prevention. *Science.* 2002;**296**:695–698. doi: 10.1126/science.1071055.
- [10] <https://www.webmd.com/food-recipes/benefits-apples>
- [11] *Ibid.*
- [12] Guarner F., Malagelada J.R. Gut flora in health and disease. *Lancet.* 2003;361:512–519. doi: 10.1016/S0140-6736(03)12489-0. [PubMed] [CrossRef] [Google Scholar]
- [13] Shinohara K., Ohashi Y., Kawasumi K., Terada A., Fujisawa T. Effect of apple intake on fecal microbiota and metabolites in humans. *Anaerobe.* 2010;16:510–515. doi: 10.1016/j.anaerobe.2010.03.005. [PubMed] [CrossRef] [Google Scholar]
- [14] <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9321083/>
- [15] <https://www.healthline.com/nutrition/apples-and-diabetes#blood-sugar>
- [16] <https://economictimes.indiatimes.com/news/india/types-of-indian-apples-and-their-health-benefits/shimla-apple/slideshow/104552924.cms>
- [17] <https://www.greaterkashmir.com/opinion/the-story-of-the-apple-and-its-association-with-kashmir/#>
- [18] <http://risingkashmir.com/ambri-an-indigenous-niche-variety-of-apple-in-kashmir-bbdf2513-4e12-4c34-b1a8-57ef78ce4cfb#:~:text=Kashmir has a long tradition,was the preferred apple variety.>