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Health Beneficial Effects of Cucumber

Shampa Chakraborty and Sadhana Rayalu

Abstract

Cucumber is a healthy fruit which having lots of benefits. Cucumber regulates hydration and maintain adequate blood pressure and sugar, soothes skin, helped in digestion and reduces fat and help to weight loss. Cucumber contains a plenty of potassium, fiber, magnesium, manganese and vitamin A, C, K. Cucumber has several health beneficial activities such as antimicrobial properties, hydrating and detoxification, help in digestion and weight loss, preventing cancer and other fragile bone disease. In this book chapter we have discussed about the health beneficial activities of cucumber along with its different contents.

Keywords: cucumber, health impact

1. Introduction

Cucumbers (scientifically known as *Cucumis sativus*) belong to the same botanical family as melons and squashes. Cucumbers are served into two types. “Slicing cucumbers” for fresh consumption and “Pickling cucumbers” for eventual processing into pickles. Slicing cucumbers are usually larger with skins, while pickling cucumbers are smaller having thinner skins. Cucumbers are very low in calories but contain important vitamins, minerals and high water content. Eating cucumbers may lead to many potential health benefits, including weight loss, balanced hydration, digestive regularity and lower blood sugar levels. The present chapter deals with the different health beneficial effects of cucumber fruit as well as its contents. Fresh cucumbers are one of the fantastic fruit. Eating habits of cucumber are great as we are accustomed to eat cucumber with their seeds. This habit has an outstanding health benefits. Cucumber seeds contain a wide variety of phytonutrients, including both carotenoids and flavonoids.

2. Result and discussions

2.1 Antimicrobial activity

Khan et al. [1] reported that Cucumber have poor activity against *Pseudomonas aeruginosa* only. Osuagwu et al. [2] reported that ethanolic extracts of leaf have antimicrobial property on pathogenic microorganisms for three human pathogens *S. aureus*, *P. aeruginosa* and *S. typhi* except *E. coli* pathogens. Sood et al. [3] reported antimicrobial activity of seeds of Cucumber family- members Karella, Cucumber, Tinda, Kaddu, loki. All seeds extracts are effective against *Serratiamarcescens*,

E. coli, *Streptococcus thermophilus*, and showed no inhibition against *Aspergillus niger*, *Candida albicans*. Mallik et al. [4] reported antifungal potentials of the ethanol extract of Cucumber against six fungus. The diameter of zone of inhibition have similar activity of the standard drug, Griseofulvin.

2.2 Phytochemical analysis

Sood et al. [5, 6] confirmed the presence of various phytochemicals like tannins, cardiac glycosides, terpenoides, carbohydrates, resins, saponins and phytosterols. Phytochemical screening by color visualization in cucumber showed the presence of flavonoid, tannin, saponin and steroid. The spectrophotometric analysis showed flavonoid 0.36% (w/w), phenol 0.40% (w/w), and, the by titrimetry found tannin 2.82%.

2.3 Nutritional composition

Urooj et al. [7] reported that among all varieties, English, Zucchini and Pranic healed cucumbers have contained highest moisture and lowest in Holenarasipur and Dotted variety. Eghtedary et al. [8] reported twenty types of cucumber (*Cucumis sativus*) from different regions. Khan [9] reported 24 genotypes of cucumber based on Randomized Complete Block Design (RBCD) method.

Cucumber, sliced, raw 1.00 cup (104.00 grams) calorie-16.

Nutrient	
Vitamin K	19%
Molybdenum	12%
Pantothenic acid	5%
Copper	4%
Phosphorus	4%
Vitamin C	4%
Biotin	3%
Vitamin B1	3%
Potassium	3%
Magnesium	3%
Manganese	3%

3. Different types of nutrients in cucumber

Cucumber contains different types of flavonoids such as apigenin, diosmetin, fisetin, luteolin, quercetin, kaempferol, luteolin, naringenin, theaflavoside I, vicenin. It also contains different types lignans pinoresinol, lariciresinol and secoisolariciresinol and triterpenes like cucurbitacin A, cucurbitacin B, cucurbitacin C, cucurbitacin D.

3.1 Medicinal uses

Shrivastava et al. [10] reported that cucumber eating in daily basis can improve hair growth and soothes skin, reduce swelling of eye. Cucumber juice can improve the skin texture and cures skin infections, eczema. A piece of cucumber on the

head for a sun stroke patient can reduce the heat of the body. Cucumber can help in weight loss and the mashed seeds with sugar before meal can reduce intestinal worms and tape worms. Boiled cucumber leaves and cumin seed roasted powders can be used for throat infections. Kashif et al. [11] reported that cucumber contained high potassium so it can help to keep normal blood pressure.

3.2 Different health beneficial activities of cucumber

Sharma et al. [12] proved that cucumber juice can acts against acidity and resist to change in pH and have good carminative and antacid potential. Cucumber has also eye soothner activities. Keeping cucumber slices on the eyes for about 10 minutes relaxes our eyes and reduces puffiness around the eyes. Patil et al. [13] investigated activity of cucumber extract in laboratory animals. They proved that the aqueous extract of cucumber selected can reduce the induced bowel disease and possessed active against ulcerative colitis. Patil et al. [14] investigated that cucumber juice can have significant wound healing effect.

3.3 Hepatoprotective activity

Heidari et al. [15] investigated the activity of cucumber juice against cumene hydroperoxide induced-oxidative stress and proved that cucumber can acts as antioxidant agent. The cucumber extracts have antioxidants and radical scavenging property. The extract help to form intracellular ROS.

3.4 Hypoglycemic and hypolipidemic activity

Sharmin et al. [16] investigated Hypoglycemic effects of cucumber and proved white pumpkin, gourd has anti hyperglycemic effects on Alloxan Induced Diabetic Rats (AIDR). The extract can lessen the high lipid profiles in AIDRs. Therefore, cucumber extracts can be useful, in the therapy of diabetes, hyperglycemia and hyperlipidemia.

3.5 Hydration and detoxification

Cucumbers contains 96% water. Therefore, it helps to fill up the daily requirement of water by the body and keep body hydrated. In summers, people tend to dehydrate easily. Consuming cucumber can make hydrate and it also acts as a coolant and give relief from the summer heat. Cucumber and mint can use to make detox water which effectively eliminates toxins from the body, improves hydration and thus results in innumerable health benefits.

3.6 Reduce blood pressure

Cucumbers are a good source of potassium, magnesium and dietary fibre. These nutrients are known to lower blood pressure, thus reducing the risk of heart diseases. Research has also proved that regular consumption of cucumber juice was helpful in reducing blood pressure, in elderly people with hypertension.

3.7 Digestion

Cucumbers act as a coolant for our stomach. The soluble fibre in cucumbers helps in slowing our digestion. Also, the high content of water in cucumber makes our stools soft, prevents constipation and keeps our bowel movements regular.

3.8 Reduces blood sugar

Cucumbers are known to reduce blood sugar levels, thus being helpful in the management and prevention of diabetes mellitus.

3.9 Weight loss

Cucumbers contain 96% of water and are low in calories. There are only 15.5 calories in 100 g of cucumber. High water and low-calorie content of cucumbers, helps in reducing weight.

3.10 Skin

Cucumbers can enhance beauty and have good effects on the skin. Application of cucumber juice on skin makes it soft and glowing. Anti-inflammatory effects of cucumber naturally lighten our skin and reduce tanning. It also reduces wrinkles and fine lines.

3.11 Reduces risk of cancer

The fibre in cucumbers protects from colorectal cancer. Also, cucurbitacin present in cucumbers possesses anti-cancer properties. Tuama et al. [17] showed cucumber extract is rich in bioactive compounds and have anticancer activity with Cell lines of (IC50) with MCF 715.6 ± 1.3 and HeLa 28.2 ± 1.

4. Effect in hair, nails and breath

Cucumbers contain silica which is excellent for hair and nail care. They help in strengthening the nails and prevent them from becoming brittle. Moreover, phytochemicals present in cucumber destroy the bacteria in our mouth that cause bad breath.

4.1 Antioxidant activity

Kumaraswamy [18] demonstrated that the yellow cucumber posses more anti-oxidant activity where as While green and white cucumbers have low antioxidant property. The antioxidant activity is due to the carotenoids, phenolic flavonoids, tannins, polyphenols and lycopene, found in it. Mallik et al. [19] carried out an study on the cytotoxic activity of cucumber extract in ethanol.

Cucumber, sliced, raw 1.00 cup (104.00 grams) calorie-16		
Nutrient	Amount	DRI/DV (%)
Protein	0.68 g	1
Carbohydrate	3.78 g	2
Fat-Total	0.11 g	0
Dietary Fibers	0.52 g	2
Calories	15.60	1
Total sugar	1.74 g	—
Monosaccharides	1.70 g	—

Cucumber, sliced, raw 1.00 cup (104.00 grams) calorie-16		
Nutrient	Amount	DRI/DV (%)
Fructose	0.90 g	—
Glucose	0.79 g	—
Galactose	0.00 g	—
Disaccharides	0.04 g	—
Lactose	0.00 g	—
Maltose	0.01 g	—
Sucrose	0.03 g	—
Soluble Fiber	0.06 g	—
Insoluble Fiber	0.46 g	—
Other carbohydrate	1.52 g	—
Fat		
Monosaturated fat	0.01 g	—
Polysaturated fat	0.03 g	—
Saturated fat	0.04 g	—
Trans fat	0.00 g	—
Calories from fat	1.03	—
Insoluble fiber	0.46 g	—
Other carbohydrate	1.52 g	—
Calories from saturated fat	0.35	—
Calories from trans fat	0.00	—
Cholesterol	0.00	—
Water	99.04 g	—
Vitamins (water soluble)		
Vitamin B1	0.03 mg	3
Vitamin B2	0.03 mg	2
Vitamin B3	0.10 mg	1
Vitamin B3 (Niacin equivalent)	0.19 mg	
Vitamin B6	0.04 mg	2
Vitamin B12	0.00 mcg	0
Biotin	0.94 mcg	3
Choline	6.24 mg	1
Folate	7.28 mcg	2
Folate DFE	7.28 mcg	
Folate food	7.28 mcg	
Pantothenic acid	0.27 mg	5
Vitamin C	2.91 mg	4
Fat soluble vitamins		
Vitamin A international unit	109.20 IU	—
Vitamin D	0.00 IU	0
Vitamin K	17.06 mcg	19

Cucumber, sliced, raw 1.00 cup (104.00 grams) calorie-16		
Nutrient	Amount	DRI/DV (%)
Vitamin E	0.05 IU	
Minerals		
Boron	0.00 mg	
Calcium	16.64 mg	2
Chloride	0.00	—
Chromium	0.00	—
Copper	0.04	4
Fluoride	0.00	0
Iodine	0.00 mg	—
Iron	0.29 mg	2
Magnesium	13.52 mg	3
Manganese	0.08 mg	3
Molybdenum	5.20 mcg	12
Phosphorus	24.96 mg	4
Potassium	152.88 mg	3
selenium	0.31 mcg	1
Sodium	2.08 mg	0
Zinc	0.21 mg	2

The nutrient profiles provided in this chapter are derived from The Food Processor, Version 10.12.0, ESHA Research, Salem, Oregon, USA.

5. Conclusion

Cucumber is an excellent and unusual food. A cup of cucumber contained 16 calorie with its peel (15 without) and 4 percent of your daily potassium, 3 percent of your daily fiber and 4 percent of your daily vitamin C. Cucumbers also contained small amounts of vitamin K, vitamin C, magnesium, potassium, manganese and vitamin A among them Vitamin K is very important for bone health. Vitamin K intake reduces fracture rates, and combine work with vitamin D can increase bone density and positively affect calcium balance. Vitamin K helps in building bones and the effects seem to be important for women. Low vitamin K levels were associated with low bone density in women, but not in men. Low intakes of vitamin K were associated with an increased risk of hip fractures in middle-age women.

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Author details

Shampa Chakraborty* and Sadhana Rayalu
Environmental Materials Division, National Environmental Engineering Research
Institute, Nagpur, India

*Address all correspondence to: shampa132@gmail.com

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