

## Nutritional Value and Benefit of Different Recent Trending Black Crops for Human Being in the World

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**ARTICLE ID: 46**

### Abstract

Anthocyanins are pigments found in foods that are black, blue, or purple in hue, and they include numerous nutrients and health advantages. Black wheat is high in on average, 100 g of black wheat include 71 g of carbohydrates, 13 g of protein, 10 g of fiber, and 3.40 g of fat. Black rice has a high protein content of 8.5 gram per 100 gram, iron of 3.5 gram, and fibre of 4.9 gram. Protein content in black soybeans is considerable (32–43.6 percent). It also contains carbohydrates, (31.7–31.85 percent), lipids (15.5–24.7 percent), water (5.6–11.5 percent), minerals. The lipid makeup of black soybeans is 86 percent unsaturated fatty acids, with linoleic (6.48–11.6 percent), linolenic (0.72–2.16 percent), and oleic acids (3.15–8.82 percent) being particularly good to human health. A variety of nutrients can be found in black sesame seeds. Black sesame seeds have the following nutrients in just 2 tablespoons (14 gram): 100 calories 3 gram of protein 9 gram of fat, 4 gram of carbohydrates, 2 gram of fiber Copper: 83 percent of the Daily Value (DV), Manganese: 22 percent of the DV, Iron: 15 percent of the DV, Zinc: 9 percent of the DV, Calcium: 18 percent of the DV, Magnesium: 16 percent of the DV, Phosphorus: 11 percent of the DV, Copper: 83 percent of the DV, Manganese: 22 percent of the DV, Zinc: 9 percent of the DV 1 gram saturated fat 3 gram monounsaturated fat, 4 gram polyunsaturated fat. About 378 calories are found in 100 gram of kala chana. There are 20 gram of protein, 63 gram of carbohydrates, 12 gram of dietary fiber, and 6 gram of total fat in this meal. In addition, kala chana contains 718 mg of potassium and 57mg of calcium. In 15 grams of peeled black garlic, there are:Calories: 40, Calories: 40, Calories: 40, Calories: 40, Calories: 40, Calories: 40, Calories: 40, Calories 2 g

protein, 0 g fat, 0 g carbohydrate 8 grammes of carbohydrates 3 g of fibre, 4 g of sugar, Vitamin C, B vitamins (B1, B2, B3, B6), Folate, Calcium, Manganese, Magnesium, Phosphorus, Zinc, and Iron are all present in significant amounts in black garlic. Chia seed is underutilized pseudo cereal with high amount of nutrients like protein (15-25%), carbohydrates (26-41%), dietary fiber (18-30%), ash (4-5%) and lipids (40%) of which 60% is omega-3. The nutrition facts for two small-to-medium raw carrots (100 grams) are: calories (41), water (88%), protein (0.9 grams), iron (0.4 mg), calcium (20 mg), vitamin-C (1.2 mg), carbs (9.6 grams), sugar (4.7 grams), fiber (2.8 grams) and fat (0.2 grams). The seeds contain a yellowish volatile oil (0.5–1.6%), a fixed oil (35.6–41.6%) and proteins (22.7%). Black cumin seed contains fatty acids (e.g. palmitic acid, oleic acid and linoleic acid). Calories (7.1), carbohydrates (1.3 g), fiber (0.4 g), protein (0.2 g), fat (0.2 g), Omega-3 Fatty Acids (9.6 mg), vitamin C (0.5 mg), vitamin B<sub>3</sub> (0.1 mg), vitamin K (0.3 mcg), calcium (3.7 mg), iron (0.8 mg), magnesium (3.9 mg), phosphorus (5.4 mg), potassium (50.5 mg), copper (0.02 mg), zinc (0.1 mg), manganese (0.2 mg) and selenium (0.1 mcg) as the major constituents,

**Keywords:** Black, Wheat, Rice, Soyabean, Chia, Chickpea, Sesame, Carrot, Garlic, Turmeric and Cumin.

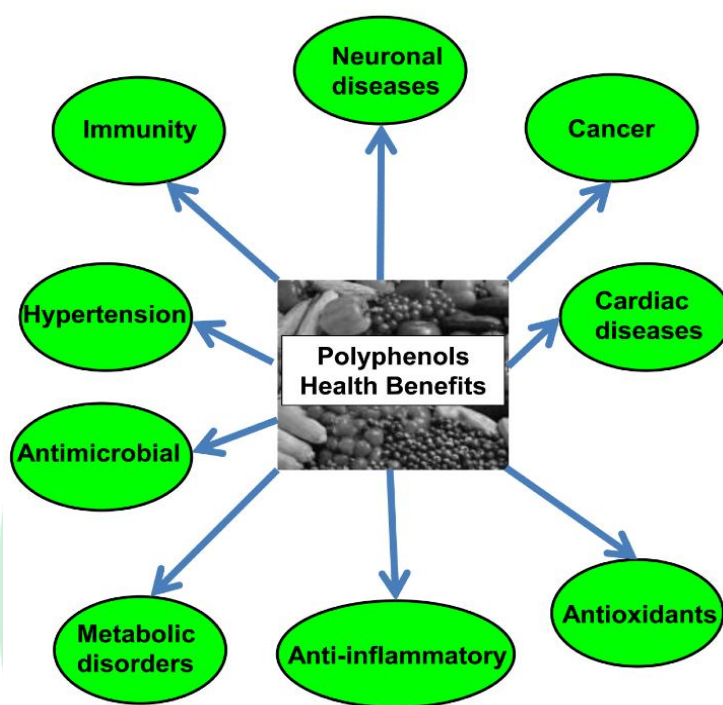
## Introduction

Antioxidant properties abound in these pigments. Polyphenols, which are phytochemicals present in fruits, vegetables, tea, coffee, chocolates, legumes, cereals, and beverages, are responsible for the black colour of food. They defend our bodies against free radical damage and Ultraviolet rays, as well as pathogen aggression. There has been a surge of interest in the possible health advantages of dietary polyphenols as antioxidants in the last two decades. Fruits (grapes, apple, pear, cherries, and berries) contain up to 300 mg of polyphenols per 100 g of fresh weight. Cereals, vegetables, dry legumes, and chocolate, among other foods, contribute to polyphenolic consumption and thereby protect our bodies from chronic diseases. Dietary polyphenols are generating a lot of buzz in the scientific community because of their potential health benefits. They are used to add colour, flavour, bitterness, and astringency to foods while also preventing oxidation.

## Role of polyphenols in plants and humans

Polyphenols protect plants from Ultraviolet light, infections, oxidative stress, and extreme weather conditions. Polyphenols are antioxidants that have anti-diabetic, anticancer,

anti-inflammatory, cardioprotective, osteoprotective, neuroprotective, anti - allergic, anti - hypertensive, anti - bacterial, cerebrovascular protection, cholesterol lowering, hepatoprotective, antifungal, antibacterial, and antiviral properties in the human body.



### Black wheat

Black wheat is said to contain the largest anthocyanin content of all coloured lines, as well as a higher iron content and nutritional value than normal wheat types. Anthocyanins are a naturally occurring water soluble pigment that gives dark vegetables and fruit their red, orange, black, blue, and purple colours, depending on the concentration of anthocyanin. Anthocyanins are antioxidants that "neutralise" ROS by removing them from the body before they can react with cellular components and change their function or structure. Higher anthocyanin content, and consequently antioxidant content, in aleurone layers may be linked to improved growth and vitamin absorption (Sharma *et al.*, 2018).

### Nutritional value

Black wheat is high in protein and has a higher anthocyanin content than blue or purple wheat, which is less frequent. On average, 100 g of black wheat include 71 g of carbohydrates, 13 g of protein, 10 g of fiber, and 3.40 g of fat.



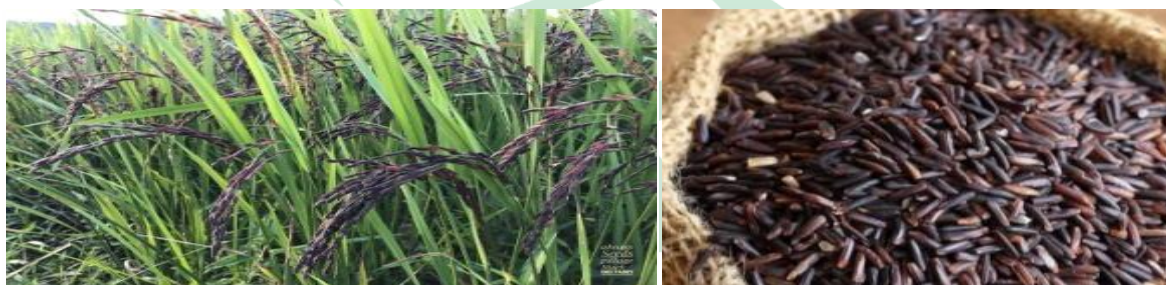
Source: NABI (National Agri-food Biotechnology Institute, Mohali, 2020)

### Black rice

With a thin covering of black bran, black rice, also known as forbidden rice or "emperor's rice," is gaining popularity due to its high amounts of antioxidants and higher nutritional value. Forbidden rice got its name since it was originally only available to the Chinese emperor in order to ensure his health and longevity. Black rice varieties may be found all across Asia. In India, Manipur grows black rice, and the name "Chakhao Amubi" comes from the Manipuri language, where "Chakhao" means tasty and "Amubi" means black.

### Nutritional value

Black rice has a high protein content of 8.5 gram per 100 gram, iron of 3.5 gram, and fibre of 4.9 gram. It contains 18 distinct amino acids, as well as copper, carotene, and a variety of other vitamins and minerals. It's commonly referred to be a super food due to its tremendous nutritional value as well as the fact that it's naturally high in anthocyanins, the antioxidant pigments that give rice its distinctive colour.



Source: Shuats, Nani Agriculture Institute, Prayagraj U.P. (M.Sc. Agronomy trial 2021

*Kharif*)

### Black Soybean

Soybeans' seed coats come in a variety of colours, including black, yellow, green, and brown. It's because anthocyanins, chlorophyll, and other pigments are present. For hundreds



of years, black soybeans have been commonly consumed as a meal and a component of Oriental medicine in Asia. The seed coat's dark colour is caused by a buildup of anthocyanins in the epidermal palisade layer. Anthocyanins such as cyanidin-3-glucoside, delphinidin-3-glucoside, and pelargonidin-3-glucoside have been discovered. Black soybeans are a great source of disease-prevention and health-promoting nutrients.

### Nutritional value

Protein content in black soybeans is considerable (32–43.6 percent). It also contains carbs (31.7–31.85 percent), lipids (15.5–24.7 percent), water (5.6–11.5 percent), minerals (calcium, phosphorus, magnesium, potassium, sodium, selenium, and so on), and vitamins (calcium, phosphorous, magnesium, potassium, sodium, selenium, and so on) (Vitamin E, B complex, etc.). The lipid makeup of black soybeans is 86 percent unsaturated fatty acids, with linoleic (6.48–11.6 percent), linolenic (0.72–2.16 percent), and oleic acids (3.15–8.82 percent) being particularly good to human health. The most digestible proteins, lysine and methionine, are found in soybeans. Sulfur amino acids and tryptophan, on the other hand, limit it.



**Source:** Ratlam (M.P.) 457340, farmer field - Pawan Kumawat and Lalit Kumar Sanodiya

### Black sesame seeds

A variety of nutrients can be found in black sesame seeds. Healthy fats like polyunsaturated fatty acids and omega-6 are found in these. Calcium, iron, magnesium, phosphorus, and fiber are all abundant in them. Anti-aging effects. The seeds are used in Chinese herbal medicine to prevent and even reverse common indicators of ageing, including as hearing loss, poor memory, and grey hair. Skin and bones in good condition. These seeds contain calcium, which helps to keep bones strong. Zinc promotes bone health by strengthening and increasing bone density. It's good for your heart. The seeds contain a lot of nutrients.

### Nutritional value

A variety of nutrients can be found in black sesame seeds. Black sesame seeds have the following nutrients in just 2 tablespoons (14 gram): 100 calories 3 gram of protein 9 gram of fat, 4 gram of carbohydrates, 2 gram of fiber Copper: 83 percent of the Daily Value (DV), Manganese: 22 percent of the DV, Iron: 15 percent of the DV, Zinc: 9 percent of the DV, Calcium: 18 percent of the DV, Magnesium: 16 percent of the DV, Phosphorus: 11 percent of the DV, Copper: 83 percent of the DV, Manganese: 22 percent of the DV, Zinc: 9 percent of the DV 1 gram saturated fat 3 gram monounsaturated fat, 4 gram polyunsaturated fat. Macrominerals and trace minerals are particularly abundant in black sesame seeds. Trace minerals are only required in small amounts by the organism, whereas macrominerals are required in larger proportions.



**Source:**Seoni (M.P.) 480882, farmer field - Pradeep Kumar Sanodiya

### Black chickpea

Because they are high in fiber and protein, black chickpea (kala chana) may assist us manage our blood sugar levels. They may help you digest your food because they are high in fiber. High-fiber diets are proven to aid digestion in humans. As we saw in the first benefit, kala chana is beneficial for controlling blood sugar levels. As a result of their high protein and fiber content, kala chana may aid in the prevention or management of diabetes.

### Nutritional value

About 378 calories are found in 100 gram of kala chana. There are 20 gram of protein, 63 gram of carbohydrates, 12 gram of dietary fiber, and 6 gram of total fat in this meal. In addition, kala chana contains 718mg of potassium and 57mg of calcium.



**Source:** Seoni, Singhori (M.P.) 480882, farmer field - Arvind Sanodiya and Santosh Sanodiya

## Black garlic

Black garlic has been used for cooking and medicinal purposes in Asian countries for centuries. These are made by aging garlic bulbs. After three weeks, they turn black and sticky and acquire a molasses-like flavor. It also contains allicin, an amino acid which offers antioxidant benefits and contains anti-inflammatory properties.

### Nutritional value

In 15 grams of peeled black garlic, there are: Calories: 40, Calories: 40, Calories: 40, Calories: 40, Calories: 40, Calories: 40, 2 g protein, 0 g fat, 0 g carbohydrate 8 grammes of carbohydrates 3 g of fibre, 4 g of sugar, Vitamin C, B vitamins (B1, B2, B3, B6), Folate, Calcium, Manganese, Magnesium, Phosphorus, Zinc, and Iron are all present in significant amounts in black garlic. Black garlic contains less allicin than ordinary garlic, the chemical that gives regular garlic some of its health advantages. Despite this, it contains a lot of amino acids, phytonutrients, and antioxidants. The concentrations, on the other hand, fluctuate as a result of the fermentation process.



**Source:**<https://www.bing.com/search?q=Black+garlic+images&pc=U316&form=CHROMN>

## Black chia

Chia seeds, *Salvia hispanica*, are a pseudo cereal high in omega-3 fatty acids, dietary fibre, polyunsaturated fatty acids, protein, all essential amino acids, calcium, and a variety of other minerals. Chia seeds are abundant in omega-3 fatty acids and have an anti-



inflammatory impact. Chia seeds generate a gel with strong water binding, oil retention, viscosity, and emulsion activity that can be easily removed for use as a thickening, emulsifier, and stabiliser in frozen meals (Ixtaina *et al.* 2008).

### Nutritional value

Chia seed is underutilized pseudo cereal with high amount of nutrients like protein (15-25%), carbohydrates (26-41%), dietary fiber (18-30%), ash (4-5%) and lipids (40%) of which 60% is omega-3.



**Source:**Seoni, Chandori Kala (M.P.) 480882, farmer –Mahesh Sanodiya and Niranjan Patel

### Black carrot

An excellent source of the colour anthocyanin is black carrots. According to reports, black carrots have an anthocyanin level of 1750 mg/kg fresh weight (Mazza and Miniati, 1993). Acylated anthocyanins are also abundant in black carrots. Black carrot extract included four main anthocyanins, two of which, cyanidin 3-sinapoyl-xylosyl-glucosyl-galactoside (27.5%) and cyanidin 3-feruloyl-xylosyl-xylosyl-glucosyl-galactoside (31.0%), were found to be 41 percent acylated (13.5 percent). Black carrots, unlike grape skin, have lower concentrations of non-anthocyanin phenolics, which can haze and precipitate clear fruit juices (Downham and Collins, 2000). Black carrot juice is a wonderful option for colouring soft beverages, confections, preserves, jellies, and fruit juices and nectars (Downham and Collins, 2000).

### Nutritional value

The nutrition facts for two small-to-medium raw carrots (100 grams) are: calories (41), water (88%), protein (0.9 grams), iron (0.4 mg), calcium (20 mg), vitamin-C (1.2 mg), carbs (9.6 grams), sugar (4.7 grams), fiber (2.8 grams) and fat (0.2 grams).





Source: <https://www.bing.com/search?q=Black+carrot++images>

### **Black turmeric**

Black turmeric is a perennial herb with bluish-black rhizome. The rhizomes of *Curcuma caesia* have a high economic importance owing to its reputed medicinal properties. Rhizome of this plant is claimed to be useful in treating several disease like piles, leprosy, bronchitis, asthma, cancer, epilepsy, fever, wounds, impotency, fertility, tooth ache and vomiting etc. The rhizome of black turmeric has a high economic importance owing to its medicinal properties.

### **Nutritional value**

It contains: alkaloids, terpenes, amino acids, carbohydrates, tannins, flavones, flavonoids, steroids, reducing sugars, proteins, anthraquinones, glycosides, cardiac glycosides. Calories (7.1), carbohydrates (1.3g), fiber (0.4g), protein (0.2g), fat (0.2g), Omega-3 Fatty Acids (9.6mg), vitamin C (0.5mg), vitamin B<sub>3</sub> (0.1 mg), vitamin K (0.3 mcg), calcium (3.7 mg), iron (0.8 mg), magnesium (3.9 mg), phosphorus (5.4 mg), potassium (50.5 mg), copper (0.02 mg), zinc (0.1 mg), manganese (0.2 mg) and selenium (0.1 mcg) as the major constituents, fatty acids that helps to improve high-density lipoprotein (HDL) in humans and protects from heart attack and stroke (Ixtaina *et al.* 2010).



Source: <https://www.bing.com/search?q=Black+turmeric+++images>

### **Black cumin (kalonji)**

Black cumin (kalonji) seeds (*Nigella sativa* L.) its essential or volatile oils have long been utilized in a variety of traditional culinary and therapeutic preparations. Consequently, the nutritional value and biological activity of black cumin have been thoroughly investigated. Analgesic, antibacterial, anti-inflammatory, spasmolytic, bronchodilator, hepatoprotective, antihypertensive, and renal protective properties of the black cumin oilseed have also been demonstrated. Additionally, black seeds exhibit a variety of antioxidant traits and functions. Knowledge of the black cumin oilseed's precise composition is crucial when considering its possible uses.

### **Nutritional value**

The seeds contain a yellowish volatile oil (0.5–1.6%), a fixed oil (35.6–41.6%), proteins (22.7%), amino acids, reducing sugars, mucilage, alkaloids, organic acids, tannins, resins, toxic glucoside, metarbin, bitter principles, glycosidal saponins, melanthin resembling helleborin, melanthigenin. The seeds have also been found to contain crude fibre, minerals (e.g. Fe, Na, Cu, Zn, P and Ca) and vitamins like ascorbic acid, thiamine, niacin, pyridoxine and folic acid (Takruri and Dameh, 1998). Black cumin seed contains fatty acids (e.g. palmitic acid, oleic acid and linoleic acid).



Source: [https://www.bing.com/images/search?q=Black+cumin+\(kalonji\)++images](https://www.bing.com/images/search?q=Black+cumin+(kalonji)++images)



### Benefits of black foods

- ❖ Black wheat is said to have more nutrition than regular wheat grains, black wheat is helpful in the prevention of stress, obesity, cancer, diabetes, and heart related diseases. While anthocyanin is available 5 to 15 passes per million in common wheat, 40 to 140 passes per million found in black wheat. Anthocyanin provides health benefits like fruits blueberry.
- ❖ In black rice fiber takes longer to digest, it makes sure that the sugar in the grain is absorbed over a longer period, maintaining normal blood sugar levels. Thus, it helps to prevent insulin levels from spiking up and can help prevent type 2 diabetes.
- ❖ The dietary fiber that we get from black rice (or any whole grains in general) has been found to protect cardiovascular health by not only maintaining normal blood pressure but also by reducing lipid levels, regulating body weight, improving glucose metabolism, and reducing chronic inflammation.
- ❖ The anthocyanin content of black rice lends it an anti-cancer characteristic. An experimental study conducted by the Third Military University in China found that an anthocyanin-rich extract of black rice successfully suppressed tumor growth and spread of breast cancer cells in mice.
- ❖ Anthocyanins rich Black soybean has potential health benefit as complementary medicine and utilized in various formulation implied for antioxidant, anti-inflammatory, nephroprotective, antidiabetic, anticancer, anti-infertility, anti-obesity, anti-arthritis, neuroprotective, antihyperlipidemic, anti-cataract and wound healing properties.
- ❖ In Black Sesame Seeds contain Polyunsaturated Fatty Acids that may reduce risk of heart diseases and can be found in nuts, seeds, and fish oils, among others.
- ❖ Black chickpea (Kala Chana) is a source of vitamins like B<sub>6</sub>, C, folate, niacin, thiamin, riboflavin and minerals including manganese, phosphorus, iron and copper. The wealth of nutrients in Kala Chana is beneficial in boosting the immune system, promote muscle mass, regulates diabetes and enhance hair, skin and nail health.
- ❖ Black garlic contains allicin, an amino acid which offers antioxidant benefits and contains anti-inflammatory properties.
- ❖ Black cumin (Kalonji) have a Antioxidant property, Lower Cholesterol, Cancer-Fighting Properties, Helps Kill off Bacteria, Protect the Liver and also helps in Blood Sugar Regulation.





- ❖ Chia seeds contain quercetin, an antioxidant that can reduce risk of developing several health conditions, including heart disease. The seeds also high in fiber, which can help to lower high blood pressure and, in turn, reduce risk of developing heart disease.
- ❖ Black carrot juice can be a good choice for colouring fruit juices and nectars, soft drinks, conserves, jellies and confectionery (Downham and Collins, 2000). Black carrots contain a high amount of nutraceutical components (Alasalvar and Grigor, 2001), colouring of foods with black carrot juice may also provide a health benefit.
- ❖ The rhizome of *Curcuma caesia* is used for fever and asthma in adults. The rhizomes act against leukoderma, epilepsy, cancer and HIV/AIDS.
- ❖ The rhizome of the herb is traditionally used for the treatment of hemorrhoids, leprosy, asthma, fever, wounds, vomiting, anthelmintic, aphrodisiac, gonorrheal discharges and inflammation. Also *Curcuma caesia* rhizome extract had been used as smooth muscle relaxant, anti-tumors and anti-oxidant.
- ❖ The fresh rhizome paste of *Curcuma caesia* is applied during the snake bite and scorpion bite. The dried powder used to mix with seed powder of *Andrographis paniculata* Wall ex. Needs and applied during insect and snake bite.

### Conclusion

Foods with pigments called anthocyanins are known as black foods. Anthocyanins are found in black, blue and purple coloured foods and have hidden nutrients. These pigments have rich anti-oxidant properties, they play a huge role in immune booster, its maintains ability of human body to fight several diseases. We can take essential nutrient in our body in the form of daily diets, and black foods also can make a significant contribution to the farmer's income.

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