

## **Chia: Return of a Super grain**

Agha Fahad Yaseen, Shahzad Maqsood Ahamd Basra,  
Department of Agronomy, University of Agriculture, Faisalabad

---

### **World's major Challenges**

In developing countries, the major problems are water shortage, flooding, weather changes, saline-sodic soil and desertification. It is predicted that the present population of the world may be increased up to 50% in 2050 and the demand of global grain will also be doubled. So, at this level sustaining food production to feed the increasing population are major challenges. Moreover, low yield per capita and the food quality is not so good to meet the nutritional and functional necessities of human body. About 2.2 million people cannot pay for a healthy diet and suffer from micronutrient and vitamin deficiencies that bound their mental and physical abilities.

### **Solution/use of super-foods**

In direction to overcome this problem, the demand of highly nutritive food has been increased. Those foods which commonly consumed to provide functional benefits and reduce the risks of chronic diseases in addition to its basic dietary roles are known as super food or functional foods.

### **Chia a super-food**

Chia (*Salvia hispanica* L.) is one of these super foods. Chia is intrinsic to the area that expands from North Mexico to Guatemala. Its seeds were usually used by Aztec people for food, medicine and paints. Now a days, chia is being cultivated in Argentina, Australia, Bolivia, Ecuador, Guatemala and Mexico. Chia plant height is approximately 1 meter which has leaves in opposite directions. Chia plant has very small flowers and due to fused flower parts, chia is

considered as highly self-pollinated plant. Its seed are oval shaped and colour is of vast range including white with black spots, grey and black. In 2009, the European Union affirmed Chia seeds as a novel grain food, enabling them to contain up to 5% of a bread items.

### **Chia History**

Before 5,000-15,000 B.C. the Aztec people used to consume chia seeds as staple food. Corn, beans, chia, and amaranth were the most important food and chia ranked 3<sup>rd</sup> position among these crops when Columbus arrived in America. Following the Spanish conquest, chia essentially disappeared for 500 years. At global level, the integration of the chia into the modern agriculture began in 1991 when researchers of Argentina and EUA started to study the chia crop under a research project known as “Western Argentina Regional Project”. The chia was classified by the Swedish botanist Carl Von Linneo in 1753, who named it *Salvia* (save or cure) *hispanica* (Spanish) that in Latin means, Spanish plant to cure or save. The tendency of global consumption of chia on the last six years, and their use as raw material to produce supplements and nutraceutical are confirming the prediction done for 129 year ago, this botanist predicted that a future this specie would be one important crop in the food industry. Today this marvellous crop has been rescued for a lot of scientists who's through of an arduous research work to bring it back to live and make it available for the nutritional

balanced future generations around the world.

### **Chia nutrition and health benefits**

Chia seeds have 33% oil (comprises of 64-67.4%  $\omega$ 3, 17.4%  $\omega$ 6, 6.5%  $\omega$ 9 and 10.5% SFAs-palmitic acid), 33.9-39.9% dietary fiber and 19-23% protein. Chia seeds have 15 times more magnesium (Mg) than Broccoli, 8 times more omega-3 than salmon, 5 times more calcium (Ca) than milk, 3 times more anti-oxidants than blueberries, 3 times more iron (Fe) than spinach, more proteins than oat, barley and wheat. Natural rich source of vitamins and minerals, suitable and meat-alternate for vegetarians, no mycotoxins, no gluten and have safer level of heavy metals.

Chia seeds were additionally utilized for therapeutic purposes, take-up of solutions, and treatment of respiratory discomfort, kidney issues, eye hindrances and other diseases. It stabilizes blood sugars and controls appetite, helps prevent diverticulitis and diverticulosis, lowers cholesterol and blood pressure, can be used as butter substitute, controls sugar cravings, treats anaemia, helps in weight loss, prevents osteoporosis, slows aging process, improves memory and overall energy, improves health of skin, nails and hair, improves digestions, mineral powerhouse and greater detoxifier and chemical free. Chia seed absorbs 27 times water more than its weight which prevents the body from dehydration and constipation during water scarce conditions as well as improves the digestive system. It improves the egg and meat quality of layers and broilers, respectively.

Unsaturated omega-3 fatty acids are nutritionally active for good health and are

valued for persons affected by heart disease, diabetes and immune response sickness. PUFAs have been used successfully in rheumatoid arthritis and bronchial asthma. Chia oil served a base in skin emollients, polish for crude earthenware make, specialty and body paints as well. Epidemiological studies suggest that dietary fatty acids rich in  $\alpha$ -linolenic acid enhanced the childhood teaching and behaviour ability and led to decreased the burden of psychiatric illnesses in adults. Healthy diet with a soluble fiber helps bring down bad Low Density Lipoproteins (LDL) cholesterol levels. Chia seeds can be used as emulsifiers and stabilizers due to their high fiber content. Chia seeds contain 5-6% mucilage, which can be used as dietary fiber. It have the capacity to form a gelatinous mass, which increases the viscosity of gastrointestinal contents and slows gastric emptying, providing greater lubrication and volume of stool. Seeds are also auspicious source of antioxidants having keampferol, chlorogenic, quercetin, polyphenols, caffeic acids and myricetin. The bioactive, antioxidant components in these foods lower the incidence of cardiovascular disease and prevent the rancidity of unsaturated fatty acids. Calcium normally acquired in eating routine through milk and cheese, is very high in seeds of Chia. Zinc is normally found in meats like beef, is found in sufficient amount in chia seeds, making them an extraordinary source for vegetarians. Zinc assumes a part in immune functions, wound healing and protein synthesis.

Chia sprouts are used as salad and its leaves are dipped in warm water which helps in reducing the fats/obesity. Chia seeds are also

milled in to flour and eaten or mostly its seeds are soaked in drinks and seed dressing is also done on the different food types to make these more nutritional. Chia seeds can

be used for enrichment of products, such as cookies, cereal bars and bakery.

-----

---

### **Noval Corona virus outbreak a Global risk .....!**

Muhammad Hammad Raza, Sabir Sattar, Safdar Abbas,

Institute of Agricultural Extension and Rural Development, University of Agriculture Faisalabad

Corona viruses are a group of [viruses](#) that cause diseases in mammals and birds. In humans, this viruses cause [respiratory infections](#). There are no vaccines or antiviral drugs that are approved for prevention or treatment. The name "coronavirus" is derived from the Latin corona, meaning crown or halo, which refers to the characteristic appearance of the virus particles. Coronaviruses were discovered in the 1960s, the earliest ones discovered were [infectious bronchitis virus](#) in chickens and two viruses from the [nasal cavities](#) of human patients with the [common cold](#). Corona viruses are believed to cause a significant percentage of all common colds in human adults and children. Coronaviruses cause colds with major symptoms, e.g. fever, throat swollen [adenoids](#), in humans primarily in the winter and early spring seasons. Coronaviruses can cause [pneumonia](#), either direct [viral pneumonia](#) or a secondary [bacterial pneumonia](#) and they can also cause [bronchitis](#), either direct viral bronchitis or a secondary bacterial bronchitis. In September 2012, a new type of coronavirus was identified, initially called "Novel Coronavirus". The World Health Organization (WHO) update on 28 September 2012 stated that the virus did not seem to pass easily from person to person. However, on 12 May 2013, a case of human-to-human transmission in France was confirmed by the French Ministry of Social Affairs and Health. In addition, cases of human-to-human transmission have been reported by the Ministry of Health

in [Tunisia](#). Two confirmed cases involved people who seemed to have caught the disease from their late father, who became ill after a visit to Qatar and Saudi Arabia. Despite this, it appears that the virus has trouble spreading from human to human, as most individuals who are infected do not transmit the virus. By 30 October 2013, there were 124 cases and 52 deaths in Saudi Arabia. In December 2019, a pneumonia outbreak was reported in [Wuhan, China](#). On 31 December 2019, the outbreak was traced to a novel strain of coronavirus, which was labeled as "2019-novel Coronavirus" ([2019-nCoV](#)) by the ([WHO](#)). By 28 January 2020, more than 130 deaths had been reported and more than 5,570 confirmed cases in this [coronavirus outbreak](#). There have also been cases confirmed in Thailand, Japan, Korea and now in the USA, all in people with links to Wuhan in China. The new form of coronavirus, which the World Health Organization (WHO) has declared a "high" risk on a global level, has now spread to over a dozen countries. Current outbreak of a novel coronavirus in China should be declared a "Public Health Emergency" of international concern." World Health Organization (WHO) is doing efforts to control the spreading of this risk while understanding the time when infected patients may transmit the virus to others is critical for control efforts. Further to minimize the risk of this outbreak threat it is much necessary to prevent exportation of cases from China to other countries or territories, and to prevent further transmission from exported case if they were

to happen. This can be achieved through a combination of public health measures, such as rapid identification, diagnosis and management of the cases, identification and follow up of the contacts, infection prevention and control in healthcare settings,

implementation of health measures for travelers, awareness rising in the population are the necessary action of time to control this risk and save the lives on the whole global.

---

## Understanding the Pathophysiology and Treatment Strategies of Rheumatoid Arthritis

Asif Hussain, Bilal Aslam

Institute of Pharmacy, Physiology and Pharmacology, University of Agriculture, Faisalabad

---

Rheumatoid arthritis (RA) is a long-term autoimmune immune multisystem inflammatory disease. Defensive immune cells start targeting body's own normal tissue or organ, especially joints. **Prevalence:** Approximately 0.5-1% of world population is affected by RA. It affects any age group individuals, however, women are approximately 3 times more effected and onset is more frequent at their 40s or 50s. Cardiovascular disease associated with chronic inflammation is the main cause of mortality in RA affected patients. **Etiology:** The etiology of RA is still unknown, however, it is assumed that genetic factors, viral or bacterial infections, obesity and smoking trigger the disease. Deregulation of anti-inflammatory cytokines and overproduction of immune cells and pro-inflammatory cytokines play important role RA pathophysiology. **Signs and symptoms:** RA is characterized by the pain, persistent inflammation of peripheral synovial joints (hands and feet) along with systemic and extra-articular manifestations. Patient experiences joint stiffness, fatigue, fever, weight loss, weakness and pain upon getting up and sitting down. **Diagnosis:** In early stages, RA resembles to other disease including osteoarthritis, gout, psoriatic arthritis and systemic lupus erythematosus, which require proper and effective diagnosis. Recommended diagnosis includes blood tests such as erythrocyte sedimentation rate (ESR), C-reactive protein

(CRP), rheumatoid factor (RF) and anemia. MRI or X-ray of joints help in monitoring the disease progression. **Treatment:** Strategies include pain and inflammation remission, maintenance of physical function, joint structure protection and control of systemic symptoms. RA management and treatment involves five main general approaches. In early stages, non-steroidal anti-inflammatory drugs (coxibs) used for pain and inflammation control. For symptomatic relief, glucocorticoids (prednisone) are given in low doses. To slow disease progress and enhance patient's life quality and expectancy, disease-modifying antirheumatic drugs (DMARD) such as methotrexate, anti-cytokines, cytotoxic and immunosuppressants are used. In severe case, surgical procedures are recommended which involve deformities correction, repair damaged joints and joint replacement. **Home remedies:** Daily routine and task management can be improved by proper diet, joint care, rest, exercise and applying cold or heat to effected parts. **Complications:** Development of newer targeted drug therapy are effective but associated with serious adverse effects such as congestive heart failure, lymphoma, nervous and blood disorders and high risk of infections are major concern. **Preventive measures:** RA is not preventable, however, maintaining healthy lifestyle, diet control and avoid or quitting smoking somewhat reduces the risk.