

CHAPTER ACTIVITIES (APRIL- OCT 2017)

- April** – World Health Day was celebrated in association with MCM DAV College, Chandigarh on 8th April, the theme being 'Depression – Let's talk Nutrition'. There were talks by Dr. S Grover from PGI, Assoc Prof Psychiatry, Dr. Ruby Ahuja, Clinical Psychologist from Paras Bliss Hospital and Mrs. Madhu Sharma, President IDA, Chandigarh chapter.
- August** – Breast feeding week was celebrated on 8th Aug in association with Govt. Home Science College, Chandigarh. CNE on the theme 'Sustaining Breast Feeding Together' was organised which was attended by nearly 100 delegates. Speakers included Dr. Chhaya Prasad, from Asha Child Care Clinic and Mrs. Manisha Arora, Chief Dietician from GMSH Sec. 16 Chandigarh. IDA National President, Mrs. Sheela Krishnaswamy was the chief guest who also spoke on the history and progress of IDA.
- September** – National Nutrition week (1-7 Aug) was celebrated along with Govt. Home Science College, Fortis Hospital, Mohali, Max Super Specialty hospital Mohali and Govt. Multi Speciality Hospital, Sector 16, Chandigarh, wherein various activities such as quiz for school children, Poster Competition for parents of children and talks by experts were organized. Govt. Home Science College held a Cookery Competition on the theme 'Innovative Nutritious Tiffins for Pre-schoolers'. Students also participated in Skit, slogan writing and poster presentation.
- October** – World Obesity Day was celebrated on 11th October at the Exotica Gym Center, Sector 16, Panchkula, where a talk was delivered by Ms. Shivani Gulati and a panel discussion with Vice President Dr. Sapna Nanda, members of the chapter and Mrs. Arti Bajaj was held.

From the Editor's Desk

Dear Colleagues,

'Small power houses of nutrition', 'Seeds of Wellness', 'Small things, big benefits' are some ways in which we can describe 'seeds'. If you are thinking of good health, think of consuming seeds such as Sesame, Flax, Sunflower, Pumpkin, Melon, Watermelon, Chia, Fenugreek and the lesser used ones such as Amaranth, Basil, Alfalfa, Pomegranate and Grape seeds.

They may be tiny in size but nutritionally, they are big store houses of several vital nutrients which prevent many diseases, keep you healthy as you age and boost your immunity. These 'future plants' contain all the nutrients a plant needs to grow and are a complete package with antioxidants, healthy fats, good protein, high soluble and insoluble fibre, B vitamins and minerals such as Zinc, Calcium, Magnesium, Potassium and Iron.

Frequent consumption of seeds is associated with lower levels of inflammatory markers (C-reactive protein, interleukin-6 and fibrinogen).

These packages of nutrients can be used as such as snacks or after being lightly roasted or sprouted. Toasted seeds can be sprinkled over curd or snacks or onto your cold or hot breakfast cereal. Besides, they add crunch as well as flavour to other foods. Sprinkle them on salads and desserts, add them to soups, sauces, pastas and pulavs for a tastier and healthier meal. They make great substitutes for fried snacks and high priced nuts. No wonder our mothers and grand-mothers took the pains of removing, washing, drying and de-seeding seeds from melons mainly to be given to us as a daily supplement of nutrients. So, add them to your diet, a fistful, a couple of times per week and reap their health benefits.

Madhu Kaul

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SEEDS – NATURE’S POWER HOUSE

Dt. Manisha Arora (R.D). Senior Dietician, GMSH-16, Chandigarh.

INTRODUCTION : Nuts and seeds have been valued for their oils as much as for a food in itself and were an important source of nutrients and energy since the earliest civilizations. Traditional cuisines have utilized the locally grown seeds for both savory and sweet dishes. In recent years there has been much interest in the nutritional properties of seeds that promote health. Today seeds are processed for their oil, ground into pastes, used as ingredients in baked goods or eaten raw or roasted as snack foods. Common types of seeds include sunflower, pumpkin, fenugreek, chia, flax, sesame and mustard seeds. Seeds are known for their low water content and high content of fats, proteins, vitamins and minerals. The energy content is mostly high due to their high fat content.

The chemical compositions of some common seeds (per 100 gm) are given below :

Seeds	Moisture (g)	Protein (g)	Total Fat (g)	Dietary Fibre Total (g)	CHO (g)	Energy (Kcal)
Gingelly Seeds (Black)	4.51	19.17	43.10	17.16	10.29	505
Gingelly Seeds (White)	3.30	21.7	43.05	16.99	10.83	517
Flax Seeds	5.48	18.55	35.67	26.17	10.99	442
Fenugreek Seeds	7.82	25.41	5.72	47.55	10.57	234
Sunflower Seeds	3.53	23.53	51.85	10.80	6.85	584
Pumpkin Seeds	4.50	30.23	49.05	6	10.71	559
Chia Seeds	6	16.5	30.7	34.4	42.1	486

Source : Indian Food Composition Tables (NIN-2017), USDA National Nutrient Data Base.

Among the various seeds, the following are of importance in India.

FLAX SEEDS : Flax seeds (*Linum usitatissimum*) were cultivated in Babylon as early as 3000 BC and may have very well been the world’s first cultivated superfood. In the 8th century, king Charle Magne believed so strongly in the health benefits of flax seeds that he passed laws requiring his subjects to consume it. Flax seeds sometimes called linseeds are small brown tan or golden colored seeds that are the richest source of a plant based omega 3 fatty acid called alpha linolenic acid (ALA). One of the most extraordinary benefits of flax seeds is that they contain high levels of mucilage gum content. Mucilage is a gel forming fiber that is water soluble & has incredible benefits on the intestinal tract. The mucilage help food in the stomach from emptying too quickly into the small intestine which can increase nutrient absorption.

Flax is also extremely high in both soluble and insoluble fiber which support colon detoxification, fat loss and reduce sugar cravings. The soluble fibre content of flax seeds trap fat and cholesterol in the digestive system

so that it is unable to be absorbed. Soluble fiber also traps bile, which is made from cholesterol in the gallbladder. The ALA fats in flax seeds benefits the skin and hair by providing essential fats as well as B vitamins which can help to reduce dryness and flakiness. It can also improve symptoms of acne and eczema. Since flax is full of healthy fats and fiber, it will help you feel satisfied for a longer time so that you will eat fewer calories overall which may lead to weight loss. Flax seeds are gluten free and packed with antioxidants (lignans) which are unique fibre related polyphenols, that provide us with antioxidants which benefit us for anti-aging, hormone balance and cellular health.

SESAME SEED : Sesame (*Sesamum indicum L.*) is a herbaceous annual plant cultivated for its edible seed, oil and flavorful value. It is also known as gingelly, til and popularly as “Queen of Oilseeds” due to its high degree of resistance to oxidation and rancidity. Sesame seed is a reservoir of nutritional components with numerous beneficial effects along with health promotion in humans. Sesame seed is high in protein, vitamin B1, dietary fibre as

well as an excellent source of phosphorous, iron, magnesium, calcium, manganese, copper and zinc. In addition to these important nutrients, sesame seeds contain two unique substances, sesamin and sesamol. Both these substances belong to a group of special beneficial fibers called lignans which have a cholesterol lowering effect in humans, prevent high blood pressure and enhance the stability and keeping quality of sesame oil along with numerous health benefits. Sesame seeds are considered as valuable foods as they enhance the diet with pleasing aroma and flavor and offer nutritional and physiological benefits. The seeds are a rich source of Vitamin E, antioxidants and bioactive compounds including phenolics, phytosterols, phytates, PUFA and short chain peptides. Such antioxidant presence leads to the prevention of degenerative diseases such as cancer, cardiovascular diseases, atherosclerosis and the process of ageing.

CHIA SEEDS : Chia (*Salvia hispanica L.*) originated from Mexico and Guatemala and it has been a part of human food for about 5500 years. The word chia is derived from a Spanish word chian which means oily; it is an oilseed, with a power house of omega-3 fatty acids, superior quality protein, and higher extent of dietary fibre, vitamins, minerals and range of polyphenolic antioxidants which act as antioxidant and safeguard the seeds from chemical and microbial breakdown. The high fibre content of chia seed can absorb upto 15 times water, the weight of seed increases stool volume and prevents from diverticulosis and cancer. The presence of higher extents of fibre help in diabetes mellitus by slowing down the digestion process and release of glucose; it also improves the peristaltic movement of the intestine and reduces plasma cholesterol.

The regular intake of chia may help the overweight men and women to lose weight. The absence of gluten in chia is another unique feature of chia as it can be digested by the patients suffering from celiac disease. The free radical scavenging activity of chia seed was even greater than many potentially strong natural antioxidant sources. The biological value of chia is superior to cereals and has a higher content of calcium, magnesium and potassium than milk. Chia sprouts are used in salads, beverages and cereal based foods.

FENUGREEK : Fenugreek (*Trigonella foenum-graecum*) is a small annual leguminous herb belonging in the Fabaceae family. Fenugreek seeds are a rich source of minerals, vitamins, phytonutrients and an ample amount of soluble dietary fiber. Non-starch polysaccharides (NSP) constitute a significant portion of this fiber content in the fenugreek seeds. Some of the major NSPs include saponins, hemicelluloses, mucilage, tannin and pectin. These compounds help lower blood LDL-cholesterol

levels and triglyceride levels by inhibiting the re-absorption of bile salts in the colon. They also bind to toxins in the food and contribute to protecting the colon mucosa from cancers. NSPs increase the bulk of the food and speed up bowel movements by relieving constipation. It has been established that the amino acid 4-hydroxy isoleucine in the fenugreek seeds has a facilitator action on insulin secretion by slowing down the rate of glucose absorption in the intestines and thus help to regulate blood glucose levels, so is recommended for diabetics. This prized spice is an excellent source of minerals like copper, potassium, calcium, iron, selenium, zinc and magnesium which further helps to control the heart rate and blood pressure. It is also rich in many vital vitamins including thiamine, Vitamin B6, folic acid, Vitamin A and Vitamin C.

SUNFLOWER SEEDS : Sunflower (*Helianthus annuus*) is a native plant to North America that has become a staple to cultures worldwide. Sunflower seeds have a high content of vitamin E, selenium, copper, have antioxidant properties which prevent cellular damage that often leads to cancer. Sunflower seeds can reduce the risk of certain types of cancer due to their high phytosterol and lignan content. Magnesium in sunflower seeds keeps our nerves relaxed by preventing calcium from rushing into the nerve cells and activating them, thereby relaxing our blood vessels and muscles too.

Sunflower seeds have a positive effect on your mood by lessening the chances of depression. They contain tryptophan, an essential amino acid that helps produce serotonin, an important neurotransmitter for relieving tension. Sunflower is a good source of folic acid (folates), which is essential for the production of new DNA, which is needed for the formation of new cells. Sunflower oil contains good amounts of zinc, which helps maintain a healthy immune system and good amount of copper for maintaining healthy skin.

PUMPKIN SEEDS : Pumpkin seeds are edible kernels of fruit pumpkin (*pepita*), olive-green in colour, sweet, buttery in texture and nutty in flavor. Crunchy, delicious pumpkin seeds are high in calories, having a wide variety of nutrients ranging from fibre, protein, calcium, magnesium, iron and manganese to copper and zinc. They also contain plant compounds known as phytosterols and free – radical scavenging antioxidants, which can give your health an added boost. Their high calorific value mainly comes from good quality protein and fats. Nonetheless, the kernels are especially rich in monounsaturated fatty acids (MUFA) like oleic acid that helps lower bad LDL-cholesterol and increases good HDL-cholesterol in the blood. The seeds are an excellent source of amino acid tryptophan and glutamate. Tryptophan is converted into serotonin which is often labelled as an anti-stress neurochemical in the brain which helps in reducing anxiety, nervous irritability, and

other neurotic conditions. Pumpkin seeds are a very good source of antioxidant vitamin-E which prevents tissue cells from the free radical mediated oxidant injury. It helps in maintaining the integrity of mucosa and skin by protecting from harmful free-oxygen radicals. Pumpkin kernels are also an excellent source of the B-complex group of vitamins such as thiamin, riboflavin, niacin, pantothenic acid, vitamin B-6 (pyridoxine) and folates. These vitamins work as cofactors for various enzymes during cellular substrate metabolism in the human body. Furthermore, these seeds contain good amounts of manganese which is an all-important co-factor for the antioxidant enzyme, superoxide dismutase. Therefore, consumption of pumpkin kernels help develop resistance against infectious agents and scavenge harmful oxygen-free radicals.

CONCLUSION : Seeds are extremely nutrient dense. They provide generous amounts of calories, good fats especially omega 3 fatty acids, complex carbohydrates, proteins, vitamins, minerals and fiber. Trace minerals like magnesium, zinc, selenium and copper are important but may be under consumed in today's largely processed diets. More than just a way to meet basic nutrient needs, seeds have been shown to protect against many diseases such as diabetes, obesity, cancer and heart disease and

proved to be excellent anti-aging agents. If you are a vegan & concerned about your health, seeds should play a role in your daily diet. Their nutrient profiles, not to mention their flavor and versatility, go a long way in making the optimal vegan diet as nutritious & delicious as it can be.

INCORPORATING SEEDS INTO A HEALTHY PLANT BASED DIET : There are myriad creative ways to add seeds to your meals and snacks, and if you are not in the crunching mood, all seeds can be made into a "butter" or spread or ground into a powder. They can be toasted or sprouted too. Add your favorite seeds to :

Dry cereal or trail mix, hot breakfast cereal or porridge, rice or pasta, whole – grain cookies, muffins, pancakes or wafers, homemade bread, leafy green salad, vegetable soups, as an ingredient in a vegetable gravy and cooked pulses, stir – fry or steamed veggies, yogurt, shakes, smoothies and other beverages, vegan "pudding" cakes and deserts.

REFERENCES

1. <https://navs-online.org/articles/nuts-seeds/>
2. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4127822/>
3. B. Srilakshmi. Nuts and oils seeds. Chapter 4 in: Food Science 6th Edition. New Age International Publishers.

OILSEEDS

Dr. Sapna Nanda, Associate Professor, Govt. College of Education, Chandigarh.

Oilseeds provide a wide variety of flavour and texture in our daily diet. They furnish important nutrients, being the embryo or part of the plant where the fat, vitamins and protein essential for the nurture of future plant, are concentrated.

The oilseeds in common use in the Indian diet are gingelly or til, sesame, linseed, poppy seed or Khus-khus, mustard seed, melon seed and safflower seeds.

The oilseeds may be considered a storehouse of nutrients. Not only do they contain a high proportion of fat but they also contain good quality protein and are a concentrated source of energy. The meal obtained after the extraction of oil from the seeds is richer in protein than the seed itself. Oilseeds contain 20 to 45 percent protein by weight. The seeds after removal of the shell or skin and after pressing out the lipids will contain up to 50 to 60 percent of protein. Not only is there a higher amount of protein present in the pressed de-oiled seeds but it is also of excellent quality. Oilseed proteins are deficient in amino-acid methionine but rich in lysine. Sesame seed proteins are, however, richer in methionine.

Oilseeds do not contain an appreciable amount of carbohydrates but contain high levels of B- vitamins. They also contain the important mineral element, iron, essential for production of red blood cells in the body. However, in amounts these are consumed, they may not contribute much to the intake of vitamins and minerals.

This protein rich meal is being used for the development of various products for use in feeding programmes. Protein isolates are also being produced from this de-oiled meal. Because of high lysine content of oilseeds, oilseed meals/ proteins are used along with cereals for product development for child feeding and weaning foods.

REFERENCES

- Gopalan, C., Rama Sastri, B.V. & Bala Subramanian, S.C. (1989). Nutritive Value of Indian Foods. National Institute of Nutrition, Hyderabad.
- Patankar, M.R. & Bharati, P. (2001). Food Preparation - A Scientific Approach. Anmol Publications Pvt. Ltd. Pp 109-111.

ROLE OF SEEDS IN PCOS (POLYCYSTIC OVARY SYNDROME)

Ms Sonia Minhas, Ms Rachana Srivastava, Ms Poonam Khanna, School of Public Health, PGIMER, Chandigarh

Polycystic ovary syndrome (PCOS) is a commonly found hormonal ailment in reproductive age women triggering irregular menstrual cycles, excessive body / facial hair, miscarriage, infertility, baldness, acne, high level androgens (male hormone), pelvic pain, high anxiety and depression. Women with PCOS develop a number of minor cysts in their ovaries leading to PCOS. These cysts lead to hormonal imbalances and initiate complications in women. Women with PCOS also produce too much insulin which enhances androgen level (Jhala et al, 2010). Untreated, it often precedes serious health problems such as diabetes, heart disease, sleep apnoea. Foods have proven to have medicinal effects in many diseases and disorders. Here are some seeds which have been found to help in relieving symptoms of PCOS.

1. Flaxseed – It assists in decreasing androgen (male hormone) levels in body. Flaxseeds are a rich source of lignin which enhances production of SHBG (sex hormone binding globulin) in the body thereby reducing the action of hormones and maintains balance. Flaxseeds are an excellent source of dietary fibre which contributes in reducing sugar and cholesterol levels. High omega 3 content reduces inflammation and risk of other metabolic diseases. (Jhala AJ 2010). Mix 1 or 2 tablespoon of freshly grounded flaxseeds in a glass of water. Drink it daily for few months until you are satisfied with the results and also include them in your regular diet.

2. Fenugreek seeds – Saponins and flavonoids found in fenugreek improve insulin mediated glucose metabolism, insulin sensitivity and balance hormones and lowers cholesterol. It causes regularity in menstrual periods (Swaroop A, 2015). Soak 2 tablespoons of these seeds overnight and take it empty stomach in the morning for best effects. You can also include fenugreek seeds and leaves in your regular diet.

3. Chia seeds – It contains more than 20% protein and 60 % omega 3 fatty acids. Chia seeds improve testosterone levels and help improve egg quality from ovary and thus improve fertility. Mix 1 teaspoon of chia seeds with breakfast cereal.

4. Sesame seeds – Black sesame seeds reduce testosterone levels, increase insulin absorption and regulate menstruation. High lignans, phytoesterol, vitamin B1, B6, calcium and magnesium help in

hormonal balance. Due to high zinc content of sesame seeds, they act as hormone regulators and enhancers, help ovulation in women and thus relieve symptoms associated with menstruation. Grind and add sesame seeds to the curries for a rich and creamy texture, sprinkle toasted seeds on salads, soups, vegetables, dosa, oats and upma.

5. Sunflower seeds – A high content of vitamin E in these stimulates progesterone production and they are rich in magnesium and selenium. Sunflower seeds offer cardio-protective benefits due to its rich content of cholesterol-lowering plant sterols. Mix sunflower seeds to tuna or chicken salad recipe, sprinkle sunflower seeds onto hot and cold cereals, or use fine ground sunflower seeds to coat meats or fish in place of flour.

6. Pumpkin Seeds – Pumpkin seeds (also called pepitas) provide many PCOS fighting nutrients. They contain beta-sitosterol which inhibits the enzyme that converts testosterone to DHT which can help reduce hair loss as well as lower cholesterol. Pumpkin seeds also contain essential fatty acids (EFAs) that our bodies need. These EFAs help regulate hormone function, improve skin and nails, lower insulin levels, stabilize blood sugars, and help regulate periods. Pumpkin seeds are a fantastic source of vitamins A, E, K and B, protein, fiber, iron, copper, phosphorus, manganese, and antioxidants. Eat 2 to 4 tablespoons of dry roasted pumpkin seeds without adding any extra salt.

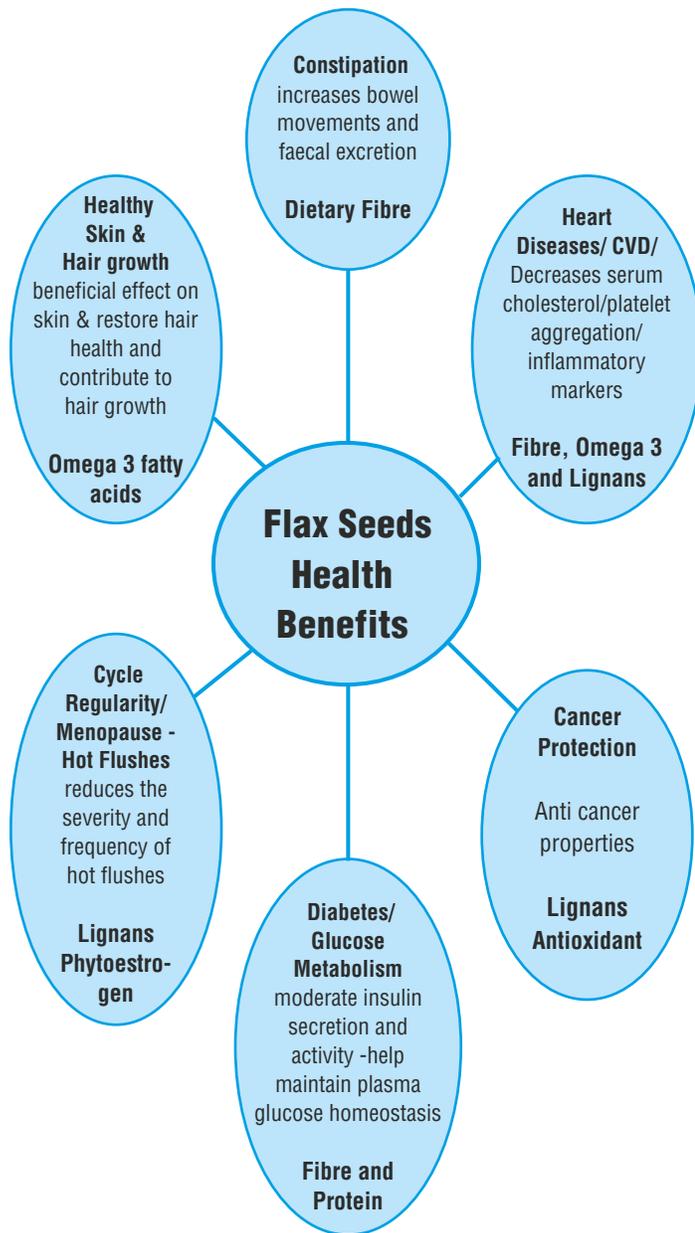
7. Poppy seeds – Poppy seeds decrease the risk of PCOS symptoms. They contain calcium, magnesium, B vitamins and zinc which play an important role in preventing and treating PCOS symptoms. Boil one tablespoon of poppy seeds in warm water then add juice of one lime and boil it for approximately 40 minutes. Strain it through cloth and drink when it is cool after every two hours.

References :

1. Jhala, A.J., and Hall, L. M. 2010. Flax (*Linum usitatissimum*L.): Current Uses and Future Applications. Australian Journal of basic and Applied Sciences, 4(9): 4304-4312, 2010
2. Swaroop, A, Jaipuria AS, Gupta, S.K., Bagchi, M., Kumar, P. and Preuss, H.G.2015. Efficacy of a Novel Fenugreek Seed Extract (*Trigonella foenum-graecum*, Furocyst TM) in Polycystic Ovary Syndrome (PCOS) International Journal Medical Science.; 12:825-831.

FLAX SEEDS : HEALTH BENEFITS

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WE ARE GOING DIGITAL

In keeping with the times, we are migrating to the digital mode for publishing this newsletter. The current issue is going to be the last one in print. In order to continue receiving this newsletter in future, please share your name, institution and email address with Ms. Sonia Gandhi —

sonia.gandhi@fortishealthcare.com

QUIZ

- Q1. Linseeds are commonly known as :
(a) Alsi (b) Til
(c) Rai (d) Kardi
- Q2. Richest source of calcium per 100gm amongst these are
(a) Gingelly seeds, white
(b) Sunflower seeds
(c) Linseeds
(d) Niger seeds, black
- Q3. *Sesamum indicum* is a scientific name of
(a) Garden cress, seeds (b) Mustard seeds
(c) Gingelly seeds (d) Niger seeds
- Q4. Pepitas are also called
(a) Pumpkin seeds (b) Chia seeds
(c) Mustard seeds (d) Flax seeds
- Q5. Proteins in one ounce serving of roasted pumpkin seeds are :-
(a) 18.5 gm (b) 8.5 gm
(c) 2 gm (d) 28.5 gm
- Q6. Chia seeds contain concentrated amounts of :
(a) Omega 3 fatty acids (b) Antioxidants
(c) Calcium (d) All of these
- Q7. Chia seeds are composed of many antioxidants namely
(a) Ferulic acid (b) Caffeic acid
(c) Quercetin (d) All of these
- Q8. What was the first cereal to be domesticated.
(a) Wheat (b) Rice
(c) Maize (d) Oats
- Q9. Which of the following grains contain gluten ?
(a) Millet (b) Teff
(c) Farro (d) Sorghum
- Q10. Which grain contains enough essential amino acids to be considered a complete protein source?
(a) Wheat (b) Quinoa
(c) Rice (d) Pearl millet
- Q11. Pumpkin seeds are good source of
(a) Zinc (b) Magnesium
(c) Tryptophan (d) All of these



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Answers : 1 (a) 2 (a) 3 (c) 4 (a) 5 (b)
6 (d) 7 (d) 8 (a) 9 (c) 10 (b) 11 (d)

RESEARCH OF INTEREST

Phenolic content, antioxidant and antiproliferative activities of six varieties of white sesame seeds (*Sesamum indicum* L.)

Xiaohui Lin, Lin Zhou, Tong Li, Charles Brennan, Xiong Fua, and Rui Hai Liu

DOI : 10.1039/C6RA26596K (Paper) RSC Adv., 2017, 7, 5751-5758

Background : Sesame seeds contain bioactive components including phenolics, vitamins, phytosterols, and polyunsaturated fatty acids, which provide a beneficial effect on human health. Sesame seed lignans have been reported to have high antioxidant activity both in vitro and in vivo experiments.

Aim : To compare the antioxidant and antiproliferative activities among different varieties of white sesame seeds, and associate the contents of phenolics and flavonoids with the antioxidant and antiproliferative activities.

Material and Methods : Six varieties of white sesame seeds (A15-4, 143-3, 243-1, 253-2, 166-2, 188-1) were kindly donated by Shanxi Academy of Agricultural Science of China in 2014 and kept at -20 °C until use. Antioxidant activity was determined by oxygen radical absorbance capacity (ORAC), hydrogen peroxyl radical scavenging capacity (ORAC), hydrogen peroxyl radical scavenging capacity (PSC) and cellular antioxidant activity (CAA) assays.

Results : According to the ORAC and PSC assays, the white sesame seeds showed high antioxidant values of 33.94 $\mu\text{mol Trolox equiv./g}$, DW and 9.39 $\mu\text{mol Vit. C equiv./g}$, DW, respectively. The free CAA values ranged from 55.66 to 224.45 $\mu\text{mol QE/100 g}$, DW in the no PBS wash protocol, and 21.88–57.36 $\mu\text{mol QE/100 g}$, DW in the PBS wash protocol. The proliferation of HepG2 human liver cancer cells were inhibited significantly after exposure to the white sesame seed extracts, with EC50 of antiproliferative activities ranging from 102.54 to 43.92 mg mL⁻¹.

Conclusion : Free phenolics make a major contribution to total phenolic content, antioxidant and antiproliferative activities. This study suggested that white sesame seeds are potential sources of functional food to prevent chronic diseases.

Ground flaxseed increased nitric oxide levels in adults with type 2 diabetes: A randomized comparative effectiveness study of supplemental flaxseed and psyllium fiber

K. Ricklefs-Johnson, C.S. Johnston, K.L. Sweazea

DOI : Obesity Medicine 5,(2017) 16-24

Background : While both psyllium and flaxseeds are plant-derived fibers, flaxseeds contain additional compounds associated with cardiovascular health including alpha linolenic acid, phytoestrogen lignans, vitamin E and carotenoids.

Aim : To determine primarily whether flaxseeds were more effective than psyllium at improving weight and cardiovascular health (glucose, lipids and blood pressure) and secondarily inflammation and oxidative stress in subjects with T2D. It was hypothesized that when matched for fiber mass content, daily supplementation with ground flaxseeds (28 g/d) would be more effective than ground psyllium fiber (9 g/d) for improving adiposity and glycemic regulation, serum lipids, blood pressure and markers of inflammation and oxidative stress in participants with T2D.

Material and Methods : In this comparative effectiveness parallel-design study, adults (18-75y) with T2D were randomized to consume either supplement for 8 weeks with anthropometrics and blood samples collected at baseline and week 8.

Results : Flaxseed and psyllium reduced waist circumference (2.8 ± 2.0 and 1.2 ± 2.4 cm, respectively; $p \frac{1}{4} 0.002$ within groups) and oxidized lipoproteins (2.8 ± 4.2 and 0.1 ± 1.5 nM/L, respectively; $p \frac{1}{4} 0.037$ within groups) without affecting body mass, lipids, or blood pressure. Flaxseeds alone increased nitric oxide (2.4 ± 3.3 vs 0.9 ± 2.7 nM/L; $p \frac{1}{4} 0.044$ between groups) suggesting flaxseeds may offer additional vasoprotection.

Conclusion : It was observed that fiber supplementation is an effective means to reduce waist circumference and oxidative stress in individuals with T2D. In addition, this study was the first to show that flaxseeds increase nitric oxide bioavailability in the vasculature of subjects with T2D.

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President, IDA, Chandigarh Chapter

NUTRITIOUS RECIPES

CHIA SMOOTHIE

Ingredients :

- 1) Hung Curd – 100 ml
- 2) Chia Seeds – 5 g
(soaked in water for half an hour)
- 3) Pomegranate Seeds – 10g
- 4) Apple – 10g
- 5) Pear – 10g
- 6) Honey – 5 ml
- 7) Mint Leaves – a few

Method :

Beat hung curd. Add soaked and sieved chia seeds. Take all the above chopped fruits and mix them with hung curd and chia seeds. Finally add honey. Serve chilled in a glass with chopped mint leaves.

No. of Serving : 1

Nutritive Value :

Energy – 103.8 Kcal Protein – 4.2 gms
Carbohydrates – 15.0 gms Fat – 3.1 gms
Fibre – 2.3 gms

FENUGREEK SPROUTS SOUP

Ingredients:

- 1) Fenugreek Sprouts – 20 g
- 2) Tofu – 10 g
- 3) Tomato – 30 g
- 4) Garlic – 4 g
- 5) Lemon Juice – 10 g
- 6) Salt and Pepper – As per taste

Method :

Steam fenugreek sprouts with 2 cloves of garlic for five minutes. Blanch tomato and grind it into a paste. Blend all the above ingredients together. Add salt and pepper as per taste. Garnish with tofu cubes and lemon juice. Serve hot.

No. of Serving : 1

Nutritive Value :

Energy – 138.9 Kcal Protein – 6.2 gms
Carbohydrates – 10.9 gms Fat – 3.1 gms
Fibre – 2.2 gms

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