

## Health Benefits of Chia Seeds

According to the American Society for Nutrition, chia seeds (*Salvia hispanica*) provide insoluble fiber which helps to keep people filled for longer duration and bulks up stool to prevent constipation. They also deliver healthy fats, protein, and cell-protecting antioxidants. Chia seeds are a good source of minerals, such as: calcium, iron, zinc, copper, manganese, niacin and magnesium.

Despite their tiny size, chia seeds are one of the most nutritious foods on the planet. They're loaded with fiber, protein, omega-3 fatty acids and various micronutrients.

**Chia seeds have high antioxidant content:**

These antioxidants protect the sensitive fats in the seeds from going rancid. Though the benefits of antioxidant supplements are



debated, researchers agree that getting antioxidants from foods can have positive health effects. Most importantly, antioxidants fight the production of free radicals, which can damage cell molecules and contribute to aging and diseases like cancer.

**Almost all the Carbs in them are fiber**

One ounce (28 grams) of chia seeds has 12 grams of carbs. However, 11 of those grams are fiber. This gives them the ability to absorb 10–12 times their weight in water. Fiber also has various benefi-

cial effects on health.

**Chia Seeds Are High in Quality Protein**

By weight, they're about 14% protein, which is very high compared to most plants. They also have a good balance of essential amino acids, so your body should be able to make use of their protein content. Protein has various health benefits and is by far the most weight loss friendly dietary nutrient.

A high protein intake lowers appetite and has been shown to reduce obsessive thoughts about food by 60% and the desire for night time snacking by 50%. Chia seeds really are an excellent protein source, especially for people who eat little or no animal products.

## Western Diet may lead to Obesity-Related Changes in the Gut

A study in mice has found that eating a highly processed diet changed the community of fungi living in the animals' guts. These alterations in the fungal community are correlated with changes in the way the animals metabolized the diet.

The microbes that live in our guts, or microbiota, are known to play important roles in how our bodies metabolize the food we eat and many other aspects of our health. However, majority of the studies have focused on bacteria, and few have looked at viruses. This means that research has largely ignored the other kingdoms of organisms we play host to, such as protists, archaea, and fungi. Recent research in humans and mice does suggest that fungi influence their host's metabolism, either directly or via their effect on bacteria.

Researchers at the University of Tennessee Health Science Center in Memphis studied fungi from laboratory mice with the same genetic backgrounds but from four different suppliers.

Their first discovery was that the gut mycobiome, which is the collective genome of fungi in the gut,



varied dramatically between mice from different suppliers. However, when they analyzed the fungi in the food pellets provided by the suppliers and those in the pellets they used in their own experiments, they found no evidence to suggest that these were a major source of the fungi in the animals' guts. This strongly suggests that the fungi were permanent residents in their intestines.

Next, they discovered that when the animals ate

a processed diet, it reduced the diversity of fungi living in their jejunum, compared with the normal diet. This, in turn, correlated with unhealthy changes in the metabolisms of male mice. In addition, changes in the mycobiome in response to a processed diet were linked to increases in serum levels of triglycerides and various hormones involved in metabolism, including insulin, leptin, and ghrelin.

Specifically, increases in these markers of unhealthy metabolism correlated with increased abundance of a fungal genus called *Thermomyces* and decreased abundance of another genus, called *Saccharomyces*. The researchers have published their results in the journal, *Communications Biology*.

## Oxidative Stress and the Role of Anti-Oxidants

**F**ree radicals are byproducts of the body's normal metabolic processes. They are unstable because they have an uneven number of electrons. This makes it easy for free radicals to react with other molecules (to form long chain chemical reactions) a process known as oxidation. For this reason, free radicals are also called reactive oxygen species. Once again, oxidation is a normal and necessary process. However, if left unchecked, these free radicals can cause cellular damage at the structural and functional levels.

The human body has mechanisms in place to stabilize or neutralize free radicals, called antioxidants which are produced by the cells themselves, and the body also relies on exogenous antioxidants present mainly in our diets, such as vitamin C, vitamin E, zinc, selenium, and carotenoids, including lutein and zeaxanthin isomers.

Oxidative stress is an imbalance between the levels of free radicals produced by the body

and the number of antioxidants available to neutralize these free radicals, said Deshanie Rai, PhD, FACN, vice president, global scientific and regulatory affairs, OmniActive Health Technologies. Under situations of oxidative stress, free radicals damage the cell's membranes, DNA, proteins, etc. "Collectively, these increase the body's inflammatory response. Normal physiological and biochemical processes are subsequently compromised making one more vulnerable to disease conditions."

"There is a point at which the body cannot keep up with the production of the reactive species. The reactive species have the capability of interacting with and damaging critical molecules like DNA, lipids, and proteins. Damage to these molecules can lead to a number of deleterious effects. These include mutations, carcinogenesis, altered protein functions, and damage to



cell membranes, which can affect many functions," he added

Nutritional antioxidants have different mechanisms of action. Four main functions are to neutralize free radicals, repair oxidized membranes, decrease reactive oxygen species production, and via lipid metabolism, short-chain free fatty acids and cholesteryl ester-neutralize reactive oxygen species.

Bryan See, senior business development manager, ExcelVite, noted that vitamin C, vitamin E (tocopherol and tocotrienol), and carotenoids are among the most recognized antioxidants.

## Are Carbohydrate Supplements Better than Protein for Post-Run Soreness?

**I**n adults with sufficient protein-intake, post-run carbohydrate supplementation is likely to be more effective in reducing mild exercise-induced muscle soreness than protein supplementation according to a recent study.

Casein and whey protein in milk contain all the essential amino acids



required to efficiently stimulate muscle protein synthesis while carbohydrates inhibit protein breakdown due to augmented insulin secretion according to the authors of the study published in *Nutrients*.

In the double blind, placebo-controlled intervention study, researchers compared the effects of an opti-

mized protein supplementation protocol to iso-caloric carbohydrate supplementation on exercise induced muscle soreness and other markers of muscle damage.

The protein group reported similar muscle soreness compared to placebo group and similar muscle-damaged markers were observed. Within the placebo group however, higher quadriceps pain thresholds were found compared to the protein group and the placebo group reported comparatively low muscle soreness on one day post-race.

Discussing the reasons for the results, the research-

ers noted that habitual protein intake was already sufficient among the participants and this many have meant the protein supplementation could not result in a superior effect above the normal diet. They also pointed out that carbohydrates can improve muscle protein balance because of the increased insulin secretion which inhibits protein breakdown. Co-ingestion of carbohydrates with protein synergistically has shown to augment insulin secretion and improves muscle-protein balance because of the increased amino-acid availability and delivery to the muscle compared with ingestion of carbohydrates alone.

### Dietary Factors Associated with Mental Health

Although there is a well-established relationship between diet and physical health, the associations between diet and mental health remain largely undiscovered.

To investigate the role of the diet in mental health, researchers from Binghamton University and Stony Brook University, both in New York, conducted an online survey of more than 2,600 participants from North America, Europe, the Middle East and North Africa (MENA) and Asia.

Young and mature women had a higher risk of mental distress during the spring season. The researchers also found negative mental health associations with high caffeine intake and moderate-to-high fast-food consumption. They also found that eating breakfast frequently and engaging in higher levels of exercise were linked to improved mental well-being among young women. In contrast, for mature women, consuming breakfast frequently was linked to a higher



rate of mental distress. However, as with young women, frequent exercise appeared to have a positive effect on well-being in mature women.

Additionally, mature women living in Asia or the MENA region reported more significant mental distress compared with those residing in North America.

Young men reported enhanced well-being in relation to frequent exercise, moderate consumption of dairy, and moderate-to-high meat

intake. Conversely, high fast food and caffeine intake were both associated with poorer mental well-being. As with mature women, mature men had a higher chance of mental distress if they lived in the MENA region. Higher education levels and moderate consumption of nuts were associated with positive mental health in mature men.

This study that appeared in the journal *Nutrients* provides insight into the associations between diet, geographical regions, and exercise in people of different ages and sexes. However, limitations include the study's cross-sectional nature, the nonrandom sampling, and the smaller sample size of mature men. As most dietary research focuses on the relationship between diet and physical health, study coauthor, Lina Begdache, Ph.D., an assistant professor of health and wellness studies at Binghamton University, hopes that these findings will promote more research into the role that diet plays in mental well-being.

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