



COCONUT FLOUR

Nutritional value and culinary application

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Introduction

Coconut flour is the by-product of coconut milk industry. Coconut flour is prepared from coconut residue called “sapal” which is the meal usually discarded after milk extraction. Medium sized coconuts selected and grated for extraction of milk. Milk extracted from the grated coconuts by grinding process. The meal remaining, called the sapal washed in hot water to reduce the oil content. Treatment with boiling water helps to reduce the fat content of the residue from 62 percent to 45percent. The residue then sun dried for 48 hours and then ground. The flour obtained stored at room temperature and be used for the preparation of variety of dishes and bakery products.

Coconut flour is a rich source of dietary fiber, protein and low in digestible carbohydrate. Dietary fiber has shown to have important health implications in the prevention for risk of chronic diseases such as cancer,

cardiovascular disease, diabetes mellitus etc. Dietary fiber can control the release of glucose in the blood thus helping in the proper control and management of diabetes mellitus and obesity (Dietary fiber).

Nutritional content of coconut flour

Coconut flour is nutritious and is a healthy source of dietary fiber. Bruce Fife, a western naturopathic physician, states that coconut flour is a great source of dietary fiber, free of trans fatty acids and is low in carbohydrates. It contains 61 percent fiber which is the highest percentage of dietary fiber found in any flour (wheat bran has 27 percent fiber). The nutritional composition of coconut flour varies from one place to other where it is grown, which mostly depends on soil nutrition, manure, rainfall and geographical factors. Coconut grown in the Pollachi belt is used for the analysis of selected nutritional components presented in Table – I



Nutrients	Value per100gm
Energy	485.76 kcal
Carbohydrate	57.42 g
Protein	17.86 g
Fat	15.81 g
Fiber	30 g

High in Protein

Coconut flour is a good source of protein. While coconut flour does not contain gluten (the type of protein found in many grains) it does not lack protein. A report from the coconut research center states that coconut flour contains more protein per serving than other leading flours such as wheat or cornmeal.

High in Fiber

Coconut flour contains almost double the amount of fiber found in wheat bran. According to a study published in the December 2006 issue of Innovative Food Science & Emerging Technologies, adding coconut flour in the diet can significantly reduce cholesterol levels. Coconut flour provides many health benefits. It can improve digestion, help regulate blood sugar, reduce the risk of developing heart disease, diabetes and certain types of cancer and aid in weight loss. Research revealed that consumption of high fiber coconut flour increases fecal bulk. Bruce Fife, explains that the recommended fiber intake is between 20 to 35 g per day. He suggests that adding coconut to the daily routine diet in the amount of a few tablespoons per day in the gravies, baked goods or even in smoothie will significantly raise the fiber consumption.



Low in digestible carbohydrate

Coconut flour contains less carbohydrate than soy or other nut flours, which is 57gm per 100 gm of coconut flour. This flour can be used much like all purpose flour to make a multitude of delicious breads, pies, cookies, cakes, snacks and desserts.

Gluten Free

Gluten is a protein found in wheat which has an elastic character, that allows dough together and trap air bubbles making bread soft and light. Although gluten has its part in bread making, all the people cannot use it for consumption because it is allergic to some people. The proportion of people affected by gluten allergy varies among different countries and population. In India gluten allergy prevalence is quite low. This rarity is most often attributed to the fact that rice, not wheat, is the dietary staple of most of southeast Asia. Patients with gluten allergy should avoid all products that contain gluten. This is the only treatment that works. Many products have hidden gluten in them. It is essential for patients to educate themselves. Patients should be aware which foods contain gluten and which foods are safe. They should learn how to have a balanced diet despite the restrictions, this may reduce the array of menu from the diet and they should be keen enough in including substantial amount of other food items to reduce the occurrence of malnutrition especially vitamins and minerals. Use of coconut flour exclusively in the bakery foods is an appropriate substitute for maida for preparing baked foods for gluten allergens.

Coconut flour is gluten free and does not trigger any inflammatory response within the body. It can be used in baking and cooking favorite desserts and sauces. In baked foods, maida can be fully replaced by coconut flour. In most cases, coconut flour cannot be substituted completely for wheat or other flours in typical bread recipes, but can replace up to 20 percent of the all purpose flour with coconut flour and gives better finished product. This much amount of substitution increases the fiber content considerably. Coconut flour can be added in breads, muffins, cakes, cookies, crackers, tarts, pies, rusk etc. For the full replacement of maida by coconut flour, addition of egg in the preparation helps in improving the appeal of the final product.

Culinary use of coconut flour

- Coconut flour can be added in the porridges to slow

down the sudden increase of blood sugar by the diabetic patients.

- Coconut flour goes well by mixing with beverages, smoothies, soups, and hot cereal. Instead of adding coconut milk, grounded coconut paste or coconut flour alone can be added in the recipe preparation which enhances the fiber value of the dish. This is a simple and easy way to add fiber in the daily diet.

- Another way to enhance the fiber content in the diet is by using coconut flour in baking. Baked foods usually made with maida flour can be fully or partially replaced by coconut flour. A sample cookie preparation using coconut flour and coconut sugar is given below.

Cashew nut and chocolate chips coconut cookies

Ingredients

Chopped Cashew nuts – 100g
 Coconut flour – 100g
 Grated coconut – 150 g
 Chocolate chips – 50g
 Butter – 100g
 Coconut Sugar – 200g
 Eggs – 4

- Preheat oven to 180 °C for 5 minutes
- Beat butter with finely powdered coconut sugar (If sugar is not getting mixed add a 1 teaspoon of boiled milk). Beat eggs separately until fluffy and add to butter sugar mixture
- Add pinch of salt, chopped almond, chocolate chips, coconut flour and grated coconuts.
- Grease the baking tray with butter and drop the mixture with spoon by leaving one inch space
- Bake for 15 – 20 minutes until slightly browned. Cool, remove from baking tray and store in airtight container.

Advantages of consuming fiber rich foods

- **Digestive health** - Dietary fiber normalizes bowel movements by bulking up stools and making them easier to pass. This can help relieve and prevent both constipation and diarrhea. Eating plenty of fiber can also reduce the risk for diverticulitis (inflammation of the intestine), hemorrhoids, gallstones, kidney stones, and irritable bowel syndrome (IBS). Some studies have indicated that a high-fiber diet may help to lower gastric acid and reduce the risk for gastroesophageal reflux disorder (GERD) and ulcers.

- **Heart disease** - Fiber, particularly soluble fiber, is an important element of any heart healthy diet. Eating a diet high in fiber can improve cholesterol levels by lowering LDL (bad) cholesterol. A high fiber intake can also reduce the risk for metabolic syndrome, a group of risk factors linked to coronary heart disease, diabetes, and stroke. Fiber can help to lower blood pressure, reduce inflammation, improve levels of HDL (good) cholesterol and shed excess weight around the abdomen.

- **Helps control blood sugar levels** - In people with diabetes, fiber slow down the absorption of sugar and helps to maintain the blood sugar levels. A healthy diet that includes insoluble fiber may also reduce the risk of developing type 2 diabetes.

- **Cancer** - Fiber acts like a broom, sweeping the intestinal contents through the digestive tract. Parasites, toxins, and carcinogens are swept along with the fiber, leading to their timely expulsion from the body. This cleansing action helps prevent toxins that irritate intestinal tissues and cause cancer from getting lodged in the intestinal tract. Colon cancer is second to lung cancer as the world's most deadly form of cancer. Many studies have shown a correlation between high fiber diets and a low incidence of colon cancer. In European countries, it was found that those who had the highest fiber intake were 40 percent less likely to develop colon cancer. Researchers at the University of Sweden, found that fiber in the diet can absorb toxins that promote cancer. Various types of fiber were examined for their absorption capacity and found to absorb 20 to 50 percent of these carcinogenic compounds. One of the primary reasons that the dietary fiber protects against colon and other cancers is that it increases intestinal transit time. If carcinogenic substances, hormones, and toxins are quickly moved through the digestive tract out of the body, they do not get a chance to irritate tissues and instigate cancer. Evidence suggests that coconut fiber prevent the formation of tumors in the colon by moderating the harmful effects of tumor promoting enzymes.

Conclusion

Coconut flour is a promising substitute for all purpose flour for baking crispy products (cookies, rusk etc). It is available as grocery item like other flours in western countries. In India, coconut flour is not available at stores, only desiccated coconut(dried coconut scrapping) is in use. Traditionally most of the south Indian recipes are prepared with coconut. Approximately every 100g of freshly grated coconut has 3 – 4 g of fiber. It is high time to evoke the fiber value of coconut. Research shows that adding even a little fiber to the diet can have a significant influence on health. It is easy to increase the fiber in the diet by simply adding a few tablespoons of coconut flour into the food preparations daily. ■