

A Review: Gluten free flour and their baking properties.

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Abstract: Beans are the seeds of one of several genera of the flowering plant Leguminosae, which are vegetables used as food for humans or animals. ¹They can be cooked in many different ways, including boiled, fried and grilled, and are used in many traditional dishes around the world. In India, pinto beans are usually eaten with rice, called "Raajma-Chawal". This combination is said to have excellent essential amino acids, vitamins and legumes as well as meat, fish, eggs, and nuts as high protein the combination of sources. ²It is a good source of protein, manganese and phosphorus, and is rich in dietary fiber and folic acid. It is a nutrient-dense legume that contains many essential nutrients. It is most often eaten whole or mashed and re-eaten in Indian and Mexican dishes. ² Pinto beans are also important for reducing bad cholesterol level. It tends to help maintain blood glucose levels. Beans are a healthy alternative to meat. Multiple studies have shown that beans may help reduce blood cholesterol in 7 to 9 year children's. Most of children avoid pinto beans in their diet, so from a future perspective, this type of cookies will be consumed in large quantities. Pinto Beans consumption improved biochemical markers coronary heart disease and diabetes mellitus risk.

Key word – Pinto beans flour, starch and gluten free cookies

1.Introduction:

Pinto beans (*Phaseolus vulgaris*) are one of the most popular common legumes in the world and India. Pinto beans are usually eaten with rice and are called "Raajma-Chawal". It is said that this combination has an excellent combination of essential amino acids. Today, beans are still the staple food in China, India, the Middle East and the Americas. Beans are low in production cost, easy to carry, and have a long storage period. Their low cost and high nutritional value make them popular all over the world. It is a good source of protein, manganese and phosphorus, and is rich in dietary fiber and folic acid. It is a nutritious legume that contains many essential nutrients. Dried beans are classified as vegetables, partly because of their high fiber content. Their nutritional content meets the dietary needs of growing children and adolescents, ¹

Protein is essential for the growth and development of children and adolescents². Boiled beans are an easy-to-chew protein source and a finger food that attracts young children. Beans are a healthy alternative to meat. Many studies have shown that legumes may help lower blood cholesterol. Dry beans are used all over the world, accounting for 50% of human food sources of grains and beans. Dried beans are included in the

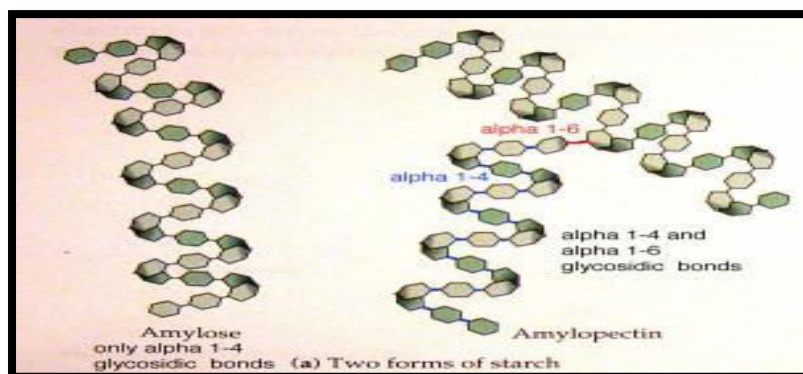
vegetable group, partly because of their high fiber content. It is most often eaten whole or mashed and re-eaten in Indian and Mexican dishes². Pinto beans are also important for reducing bad cholesterol levels. They are also a good source of thiamine, an essential vitamin. They also show clear benefits of soluble fiber in preventing heart disease. Pinto beans usually have many health benefits. When cooked and eaten without salt, they contain very low fat and sodium, which is an excellent weight loss food in itself. For example, when used to develop baked goods, flour from certain varieties of navy beans and pinto beans forms a stronger structure than Great Northern soybean flour. Since beans are gluten-free crops with high starch content (22-45%, dry basis), the physical and chemical behavior of whole soybean flour may depend on the functional and chemical properties of its starch part.²

1.1 Food applications and used of pinto beans flour:

pinto bean starch and flour can be used as baking and candy technology to make bread slices, cookies, etc., pinto bean starch and flour have broad application prospects in the food and baking industries. Gluten-free flour is used in the baking and confectionery industries to make biscuits and breads. Nowadays, there is a higher demand for gluten-free products in the market because people have health problems when they consume gluten products. Products made from pinto beans are more beneficial than other pasta products because pinto beans are rich in protein, fat and fiber.

2. Gluten free flour and their baking properties

Based on observations and studies on the baking characteristics and microstructure of pseudo-grains in gluten-free bread recipes, amaranth, pinto beans and buckwheat are considered potentially healthy and high-quality ingredients in gluten-free bread. They found that patients with celiac disease must avoid gluten-containing foods. According to reports, finding high-quality gluten-free products is the main problem faced by patients with celiac disease. In addition, pinto beans and buckwheat are excellent nutrients; energy and protein content are beneficial foods for patients with celiac disease.⁴



Source: Ryan Andrews ,Ms Precius nutrition (2017),Precious nutrition

3. Disadvantages of gluten free cookies

Intestinal Damage

The possibility of intestinal damage is the main disadvantage of gluten. For people with celiac disease, eating gluten-containing foods can cause an immune response and damage the lining of the small intestine. Because most nutrients are absorbed through the small intestine, this can lead to nutritional deficiencies. For patients with celiac disease, only a small bite of gluten can trigger the release of antibodies, which attack the intestines. Symptoms include flatulence, bloating, and diarrhea.

Digestive Complaints

For people without celiac disease, gluten may also be a problem. According to the Institute of Nutrition and Dietetics, non-celiac gluten sensitivity, sometimes called gluten intolerance, is considered to be more common than celiac disease, affecting 18 million adults and children in the United States. Although this condition does not involve the immune system or cause intestinal damage, non-celiac gluten sensitivity can cause digestive discomfort

4. Gluten free flour market

Global market data for gluten-free products show that between 2015 and 2020, sales of gluten-free products are expected to grow at a compound annual growth rate of 10.4% [With the continuous increase in the clinical application and popularity of gluten-free diets, consumption The needs of consumers will of course continue to influence the food market and the labeling standards of gluten-free products. In 2013, the European Union Regulation 2013 established rules on the ingredients and labeling requirements of gluten-free products. These guidelines ensure that people who are intolerant to gluten fully understand the natural gluten-free foods and gluten-free foods. The difference between foods produced, prepared and/or processed to reduce their gluten content. In the same year, the US Food and Drug Administration ruled that products with a "gluten-free" label should not exceed the 20 parts per million threshold, although the official compliance date is set in 2014.

This guide can help customers who are wary of gluten navigate the current market and protect themselves from consumer products that may exacerbate their symptoms and/or activate immune-mediated damage, even if they are asymptomatic mucosal damage. A gluten-free diet includes food groups that are naturally gluten-free, such as fresh fruits, vegetables, seafood, meat, poultry, beans, nuts, and most dairy products. However, some of these products may also contain "hidden" gluten. Therefore, product labels and ingredient lists need to be carefully reviewed. For traditional gluten-containing foods, such as baked products, there are currently a variety of gluten-free foods to choose from. They are based on gluten-free grains and pseudo-grains such as rice, corn, quinoa, millet and amaranth⁴.

5. Common gluten free flour and example of gluten free flour:

Sorghum flour

Sorghum flour is made from an ancient grain that has been cultivated for more than 5,000 years. This grain is naturally gluten-free and is considered the fifth most important grain in the world. It has a light colour and texture, as well as a mild sweetness. Considered as heavy or dense flour, it is usually mixed with other gluten-free flours or used in recipes that require a small amount of flour. Sorghum grains are rich in fiber and protein, which can help slow down the absorption of sugar. It is also rich in mineral iron and antioxidants, which can help you, fight inflammation.

Brown rice flour

Brown rice flour is made from ground brown rice. It is considered a whole-wheat flour that contains bran, germ and endosperm. It has a nutty flavour and can be used to make batters, thicken sauces, or prepare breadcrumbs such as fish and chicken. Brown rice flour is commonly used to make noodles and can be mixed with other gluten-free flours to make bread, biscuits, and cake recipes. This flour is rich in protein and fiber, both of which help lower blood sugar levels and reduce weight. It is also rich in iron, vitamin B, magnesium and manganese, and a plant compound called lignans. Research shows that lignans help prevent heart disease.

Oatmeal

Oat flour is made by grinding whole wheat oats. Compared to all-purpose flour, it provides more flavour to baked goods and produces a chewy, crumbly texture. Baking with oat flour may make your final product more moist. Due to the lack of gluten, some ingredients need to be adjusted to make light and fluffy baked goods. Oats contain a soluble fiber called beta-glucan, which has many health benefits. This fiber can help lower "bad" LDL cholesterol, as well as blood sugar and insulin levels. They are also rich in other nutrients such as protein, magnesium, phosphorus, B vitamins and the antioxidant group oat anthranide. Oats and oat flour are often contaminated, depending on how they are grown and where they are processed. If you can't eat gluten, be sure to look for products that are certified gluten-free.

Corn flour

Corn flour is a very finely ground corn flour. Cornmeal is made from whole grains, including bran, germ and endosperm. It is commonly used as a thickener for liquids and can be used to make tortillas and bread. Corn flour is available in white and yellow, and can be mixed with other gluten-free flours to make pizza crust. It is rich in fiber and is a good source of carotenoids lutein and zeaxanthin. These two plant compounds act as antioxidants and can benefit eye health by reducing age-related macular degeneration and reducing the risk of cataracts. It is also rich in vitamin B6, thiamine, manganese, and magnesium and antioxidant selenium.

6. Literature review

Jarosław Korus *et al.* (2014) studied the use of debittered corn flour as a natural nutrient fortifier for gluten-free bakery products, and examined its effects on the rheological properties of dough, bread quality and staleness.

They observed that debittered corn flour is gluten-free baked. Due to its technical effects, including structural enhancement and sensory improvement, acorn flour is more expensive than starch, so its use in gluten-free formulas was a rich source of protein, minerals and dietary fiber. The impact on the price of bread is small, because the cost of raw materials accounts for about 30% of the total cost of bread production.

Swata rai *et al.* (2011) studied that the quality characteristics of gluten-free cookies prepared from different flour combinations. Gluten-free flour combinations can be used to produce high-quality biscuits with acceptable physical and sensory qualities. These cookies are good for people with gluten intolerance and low-income groups. All mixed flours (sorghum, pearl millet) have significantly improved the gelatinization quality, functional properties, sensory quality and nutritional value of biscuits.

Kun Wang *et al.* (2017) studied the latest development of gluten-free bread baking methods. They showed that celiac disease is one of the most common human intestinal malabsorption diseases. They observed that the increasing incidence has promoted global interest in various ideal gluten-free breads and applied several methods to understand and improve gluten-free bread. They focused on the improvement of gluten-free bread in the past five years, including the use of new alternatives, such as flour, functional ingredients, processing aids, additives, innovative technologies and their combinations.

B. Miñarro *et al.* (2012) studied that the effect of legume flour on the baking characteristics of gluten-free bread. They observed the properties of four gluten-free bread recipes and the possibility of substituting other soy protein for soy protein. They also showed that four bread recipes are made with chickpea flour, pea isolate, carob germ flour or soy flour. They compared with other batters, the structure of carob germ batter is thicker, which may be due to the different protein behaviour and residual gum in the carob germ flour. Bread containing legume flour shows good physical and chemical properties and appropriate sensory characteristics. Chickpea flour and soybean flour.

Courtney Wayne Simons *et al.* (2013), studied the characteristics, characteristics and functions of edible soybean meal. They showed that bean flour generally has excellent extrusion properties (good expansion and texture), and that the expansion and texture integrity of pre-cooked flour are much lower compared to the raw bean flour and starch portion. The nutrients of flour (protein, total starch, fiber and ash) are generally retained after extrusion. They reported that lipids and resistant starch (RS) were significantly reduced. It also shows that a significant reduction in RS results in snacks with a high glycemic index. In addition, the raffinose content of the extrudate was reduced by 20%, indicating that the possibility of flatulence after extrusion processing was reduced. Sensory evaluations of pinto, navy, and black bean snacks indicate good overall acceptance.

Courtney W. *et al.* (2014) studied the strengthening of textured pinto bean protein in the straight dough formula. They show that it contains 5%-10% of an organized, textured, high-protein portion, and prepares the best dough and bread characteristics. And level 3 tests and observe that 5% THPH (Texture high protein fraction) product is closest control and researched at the level of 5% THPF, the lysine concentration increased by 48% without any significant negative influence of the influence on the quality parameter. It has also been observed that THPF used as an ingredient in bread has a negative impact on the improvement of protein quality. They showed that 15% level is not recommended for the effect of dough and bread characteristics, even if lysine is increased by 139%.

Alex A. Anton *et al* (2008), studied the Effect of pre-dehulling treatments on some nutritional and physical properties of navy and pinto beans. They observe that effect of low and high temperature pre-shelling treatment on some nutritional and physical properties of navy and pinto beans was investigated, and also observed that the coating before freeze drying 20min

Exposure to the highest moisture content produces the largest seed coat and is independent of drying condition, and also they showed that the nutrition characteristics of legume varieties are significantly different. Phytic acid is unaffected and highest antioxidant activity and increases with the time of exposure to increase but not affected by freeze drying and they showed that the Significant physical changes are the highest yellowness and the lowest peak viscosity Detected in soaked and heat drying beans.

M. Siddiq *et.al* (2013) Studied that the Functional properties of flour from low-temperature extruded navy and pinto beans, showed that the process for producing soy bean flour by low-temperature extrusion is proposed. They showed process for producing soy bean meal by low-temperature extrusion is proposed. The analysis and measurement of functional properties show that the extruded flour has properties suitable for making biscuits. They found that the appearance, flavour characteristics and baking volume of biscuits made from soybean flour were almost the same as those of flour. Consumer acceptance tests show that consumers prefer biscuits made from flour and believe that they are significantly better than biscuits made from STC soy flour in terms of flavour, texture and overall acceptability. Research is different from higher extrusion temperatures. 85 extrusions not only retain the raw materials required for the functional properties of soy flour, but also produce high-quality baked products. Low temperature extrusion is used to produce a safe and acceptable substitute for wheat instead of soy flour.

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