

Natural gum-based gluten free binder for millet flours

Background information/ Reason for technology development:

Indian millets are nutritionally rich in proteins, vitamins, and minerals, making them nutritionally superior to wheat and rice. Being gluten-free and having a low glycemic index, they are suitable for people with celiac disease or diabetes. However, the absence of gluten limits their use in making soft, pliable rotis, as millet dough lacks binding ability, causing difficulty in rolling and leading to coarse, dry, or easily breakable rotis. This makes it challenging to achieve thin, evenly shaped rotis. Gluten provides the elasticity and structure needed for the dough to stretch easily and hold its shape during rolling and cooking. Gluten also helps retain moisture and softness, so millet-based rotis have a shorter shelf life. Hence, there is a growing need to develop innovative gluten-free flours or mixes with better nutritional, functional, and rheological properties to overcome these challenges.

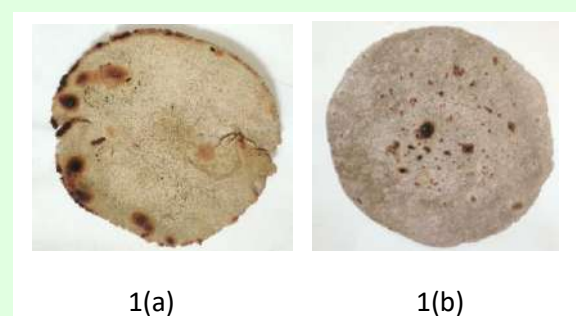


Fig.1 Chapati made from (a) conventional Bajra flour and (b) Bajra flour added with a natural gum-based gluten-free binder.

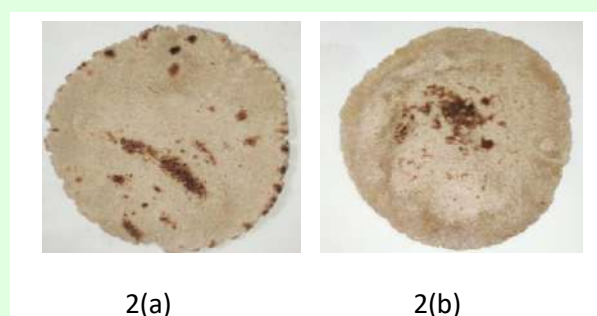


Fig.2 Chapati made from (a) conventional Jowar flour and (b) Jowar flour added with a natural gum-based gluten-free binder.

Salient Features:

- The invention specifically Provides a gluten-free binder composition specifically designed for millet flours.
- No synthetic additives or preservatives are added to the formulation, having a better shelf life and nutrient composition.
- The millet dough prepared with the improved gluten-free binder compositions shows:
 - Improved cohesiveness (binding ability)
 - Better stretchability and flexibility
 - Higher water absorption capacity
- Enables preparation of bread, noodles, pasta, chapati, and roti with better sensory qualities, without adding any synthetic additives or preservatives
- The resultant food products are soft, easily breakable, chewable, and have good textural parameters and good storage life.
- Focuses on developing a gluten-free flour composition for millets suitable for making chapatis with good dietary and rheological properties.



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- Utilizes functional ingredients such as: Guar gum, psyllium, xanthan, gum Arabic and tamarind gum alone or in a specific combination.
- Ideal for individuals with celiac disease, gluten intolerance, or diabetes, and promoting healthier diets.

Benefits:

- **Improves Dough Quality:** Enhances elasticity, binding, and cohesiveness of millet flour dough, making it easier to roll and shape.
- **Better Texture and Softness:** Produces soft, flexible, and non-crumby flatbreads (chapati/roti) with improved puffing and chewability.
- **Natural and Safe:** Completely free from synthetic additives and preservatives — safe for gluten-intolerant and health-conscious consumers.
- **Mimics Gluten Functionality:** The natural gum-based binder replicates gluten's structural and functional roles in dough formation.
- **Versatile Application:** Suitable for preparing a variety of millet-based foods such as bread, noodles, pasta, chapati, and roti.
- **Scalable for Industry and Households:** Applicable for both domestic cooking and commercial food production.

Target market/Potential clients:

- ✦ Gluten-free food manufacturers such as commercial bakeries, baby food manufacturers, functional food and health supplement companies.
- ✦ Companies that supply gluten-free ingredients and products to retailers, restaurants, and food service providers.
- ✦ E commerce platforms offering a wide variety of gluten-free and millet-based flours and products, helping reach customers in all regions.
- ✦ Health and nutrition organizations that promote gluten-free diets and encourage the use of millet flour with suitable binders.



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