



TURNING SURPLUS INTO SUCCESS: A GUIDE FOR BANANA FLOUR MANUFACTURING

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ABSTRACT

This article explores the process of making banana flour to help reduce waste of surplus bananas. It explains how surplus or imperfect bananas are transformed into a shelf-stable product, extending their usability and value. The article discusses the benefits of banana flour manufacturing, including extended shelf life, diversified product offerings, and increased profitability for farmers and food processors. Additionally, it highlights the versatility of banana flour and its potential applications in various food products.

BANANA FLOUR – AN OVERVIEW

Banana flour, a valuable product that manufactured from ripe or unripe banana that offers numerous benefits. It is rich in resistant starch, aiding digestion and promoting gut health. It contains potassium, vitamins, and minerals, that supports overall wellbeing. It is gluten-free and have low glycemic index that helps regulate blood sugar levels. By adopting flour manufacturing techniques post-harvest losses of bananas can be minimized. It also offers farmers an additional revenue.



STEPS INVOLVED IN BANANA FLOUR MANUFACTURING

The production of banana flour involves several key processing steps to transform firm bananas into a fine powder suitable for culinary and industrial applications. Here's an overview of the typical processing steps involved.

1. Selection of Raw Materials:

Ripe but firm bananas are selected as the raw material for banana flour production. These bananas that having a high starch content are ideal for flour production. Grand nain (G9) variety of banana are most suitable for commercial flour production.

2. Blanching (Optional):

Blanch the bananas by immersing them in boiling water or steam for 3-5 mins at 90°C. Blanching deactivates enzymes that cause browning and deterioration, preserving the bananas' color and flavor. It also promotes easy peeling of skin.

3. Peeling & slicing

The blanched bananas are peeled to a remove the outer skin. Once peeled, the bananas are sliced into thin slices (4 mm thickness) to facilitate the drying process and increase surface area for moisture removal. Thickness of slices can be adjusted based on requirement.

4. Drying:

The sliced bananas are dried to reduce their moisture content and prolong shelf life. It should be dried from 75% to 5%. The drying process is critical step to preserve the nutritional content and flavor of the bananas. So proper drying should be done before milling. There are several methods for drying bananas viz. Sun-Drying, Oven-Drying and Freeze-Drying.

5. Milling and Grinding:

Once dried, the banana slices are milled and ground into a fine powder using milling equipment such as hammer mills, disk mills, or attrition mills. The milling process breaks down the dried banana slices into smaller particles (120 mesh size), resulting in banana flour with a uniform texture and consistency.

The particle size of the banana flour can be adjusted depending on the desired application, with finer particles often preferred for baking and cooking.

6. Packaging and Storage:

Raw material to powder ratio is 4:1. The banana flour is packaged in moisture-proof bags or containers to maintain its freshness and prevent moisture absorption. Proper packaging is essential to protect the banana flour from environmental factors such as humidity and light, which can degrade its quality over time. The packaged banana flour is stored in a cool, dry place away from direct sunlight to extend shelf life.

-By following these processing steps, bananas are transformed into high-quality banana flour, ready to be used in a variety of culinary and industrial applications.



Steps involved in Banana flour manufacturing

USES OF BANANA FLOUR

Baking: Banana flour serves as a gluten-free alternative to wheat flour in baking recipes. used to make bread, muffins, pancakes, and cookies.

Thickening Agent: Due to its high starch content, banana flour is an effective thickening agent. It can be added to soups, sauces, gravies, and smoothies to achieve the desired consistency.

Gluten-Free Cooking: For individuals with gluten intolerance or celiac disease, banana flour offers a safe alternative for cooking and baking without compromising texture or taste.

Nutritional Boost: Banana flour is rich in resistant starch, which acts as a prebiotic fiber. It can contribute to improved digestion and gut health when incorporated into various dishes.

Savory Dishes: In addition to sweet treats, banana flour can be used in savory dishes such as veggie burgers, coatings for fried foods, and as a thickener for casseroles or stews.

Smoothies and Shakes: Adding banana flour to smoothies and shakes can enhance their nutritional value by increasing fiber content and providing a subtle banana flavor.

Texture Enhancer: Banana flour can improve the texture of gluten-free baked goods, making them softer and moister compared to other gluten-free flours.



Advantages of manufacturing Banana flour

Using banana flour as a means to control losses of bananas involves transforming surplus or imperfect bananas into valuable products.

Utilization of Surplus or Imperfect Bananas:

Bananas that are overripe, damaged, or unsuitable for fresh consumption can be processed into banana flour instead of being discarded. This reduces waste at the farm level and throughout the supply chain.

Extended Shelf Life: Banana flour has a longer shelf life compared to fresh bananas. By converting excess bananas into flour, farmers and suppliers can preserve the fruit's nutritional value and prevent losses due to spoilage.

Market Opportunities: Banana flour appeals to health-conscious consumers seeking gluten-free and natural alternatives. By tapping into this market segment, producers can access new opportunities and potentially increase profits.

Nutrition supply: Banana flour supplies more nutrients to people. Adding flour as an ingredient in any dishes improves the taste and also the nutritional qualities.

Value Addition: Processing bananas into flour adds value to the product. Instead of selling bananas at a lower price due to oversupply or imperfections, farmers can command a higher price for banana flour, contributing to increased profitability.

Storage and Transport: Banana flour is lightweight and compact, making it easier and cheaper to store and transport compared to fresh bananas. This reduces logistical costs and minimizes losses during transit.

Name	Amount/ 100 g of Green Banana Flour
Energy	340 kcal ^a
Protein	3.0 g ^a
Carbohydrate	82.1 g ^a
Total Starch	78.43 g ^a
Resistant Starch	40.14 g ^a
Total Fiber	8.50 g ^b
Soluble Fiber	1.34 g ^b
Insoluble fiber	7.15 g ^b
Sugars, total including NLEA	10 g ^b
Total lipid (fat)	1.8 g ^a
Potassium (K)	1491 mg ^a
Magnesium (Mg)	108 mg ^a
Phosphorus (P)	74 mg ^a

Nutritional content

(Source: seawindfoods.com)

CONCLUSION

Banana flour manufacturing offers a sustainable solution to minimize post-harvest losses of bananas. By processing surplus or imperfect bananas into shelf-stable flour, farmers and food processors can reduce waste and extend the usability of their produce. This not only benefits the environment but also creates economic value by producing versatile, marketable products. By this banana flour manufacturing presents opportunities for a more efficient and profitable banana industry.