

"INTRODUCTION TO AGRICULTURAL PRODUCT DEVELOPMENT"

Sharing Research Experience

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Chumporn Campus

Pilot Plant





Meat Production Line



















Types of Meat Product

1. Non-comminuted products

: meat that has not been reduced in size, ground, chopped, minced, or restructured. The original muscle structure, tissue fiber, and shape of the fresh meat remain largely unchanged.





Types of Meat Product

2. Comminuted products

2.1 Coarse Ground Meat Products:

meat that has been passed through a larger grinder plate or chopped to retain a chunky, substantial texture and larger particle size rather than a fine, paste-like consistency







Types of Meat Product

2.2 Meat Emulsion product:

where finely chopped fat particles are suspended and stabilized within a continuous water-and-protein matrix.











Bakery Production Line













Fruit & Vegetable Production Line











Fruit & Vegetable Production Line

















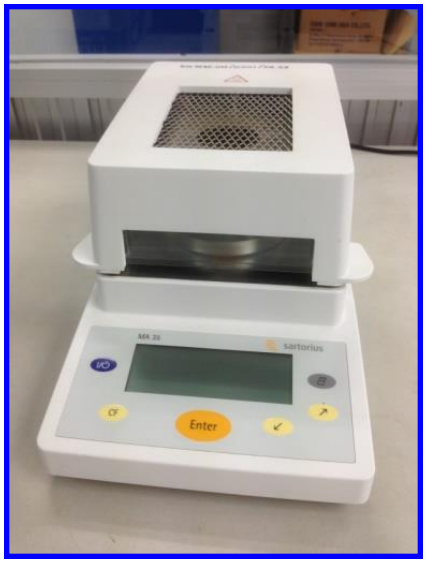
Scientific Facilities

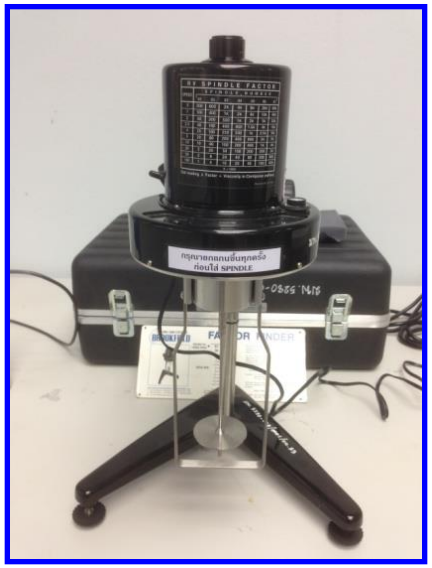
- Food Microbiological Laboratory
- Food Chemistry Laboratory; Proximate Analysis, etc.
- Physical Property Testing Equipment; Colorimeter, Viscometer



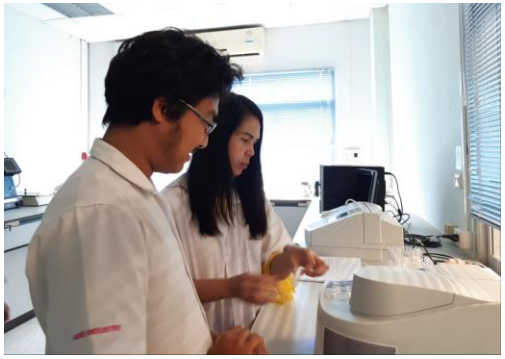


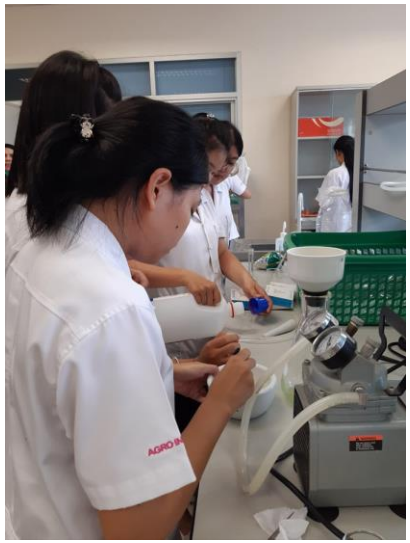






Scientific Facilities













Food Production and Development Knowledge Center









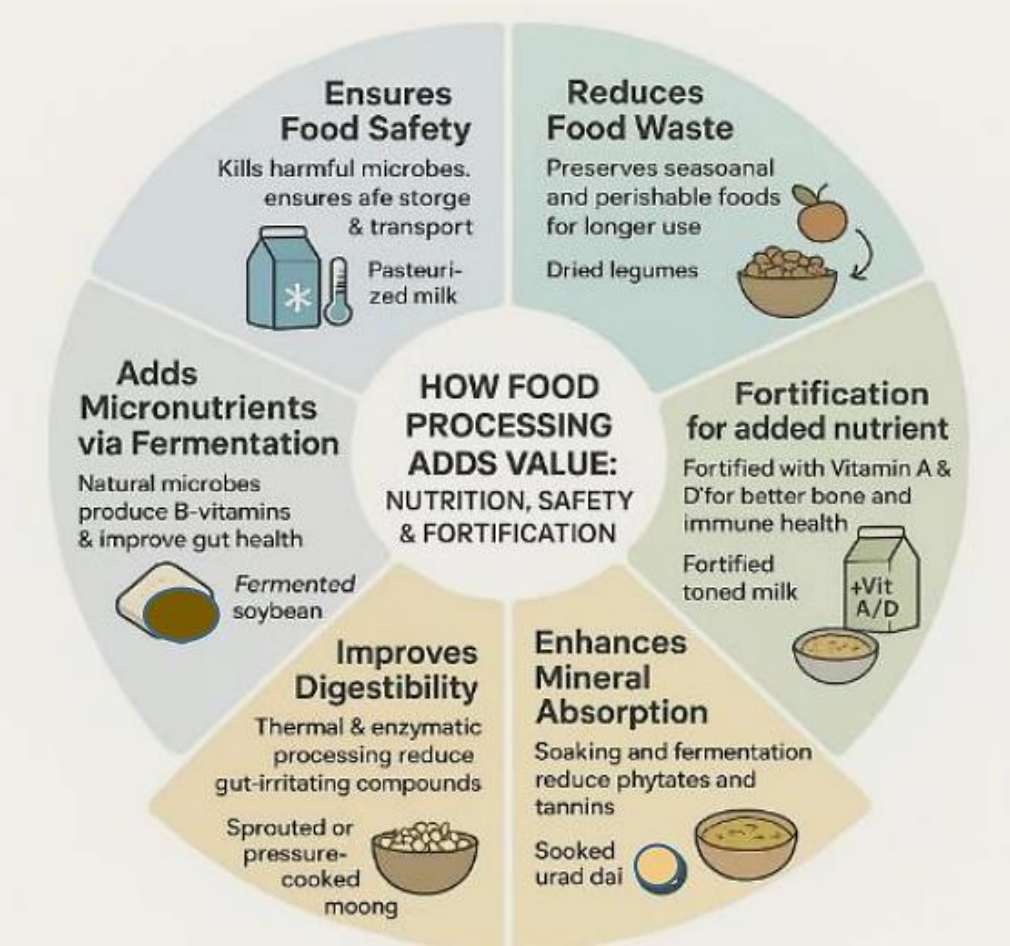


Today‘s Presentation

- Introduction to Product Development
- Research Areas

EVOLUTION OF FOOD PROCESSING			
Period	**Consumer expectation**	**Industrial Response**	**Technology Used**
Past	**Quality and safety**	**To deliver an abundant and safe supply food to consumers**	**Conventional technology**
Current	**Mildly preserved convenience foods; fresh-like qualities**	**Greater convenience, and enhanced health and wellness**	**Emerging technology**

The benefits of food processing



https://www.niftem.ac.in/storage/uploads/media/1TnLwY1qlT38LwVhHJlAZlxVXfGqg7ZKhUAJFWRC.pdf

Product Development





8 Steps of New Product Development

1. Idea Generation
2. Idea Screening
3. Concept Testing
4. Business Analysis
5. Product Development
6. Test Marketing
7. Commercialisation
8. Review of Market Performance

Step1: Idea Generation

- Internal idea sources
  - R&D or employees
- External idea sources
  - Distributor and Suppliers, also **COMPETITORS!!!**

Step1: Idea Generation (Continued)

- **Brainstorm product issues**
- Use your research and development (R&D) processes
- Review your quality assurance (QA) processes
- Review your customer complaint records
- Review your research
- Talk to your suppliers and other business partners
- Research and understand your competition
- Study catalogues and product information

Step2: Idea Screening

In order to spot good ideas and drop poor ones

"SWOT analysis"



https://en.wikipedia.org/wiki/SWOT_analysis#/media/File:SWOT_en.svg

Step2: Idea Screening (Continued)

Your criteria might include; *E.g.*

- most prominently identified customer needs
- product improvements most needed
- the benefits to your target market
- **the technical feasibility of the idea**
- the level and scope of research and development required
- the profitability of the idea. What is its potential appeal to the market? How would you price it?

Step2: Idea Screening (Continued)

Your criteria might include; *E.g.*

What is its potential appeal to the market?

How would you price it?

What are the costs in bringing it to market — overall and per unit?

Where the product fits in the market.

Is there a gap? How close is it to competitor products?

the resources it will require in development

the marketing potential of the idea

the fit with your business profile and business objectives.

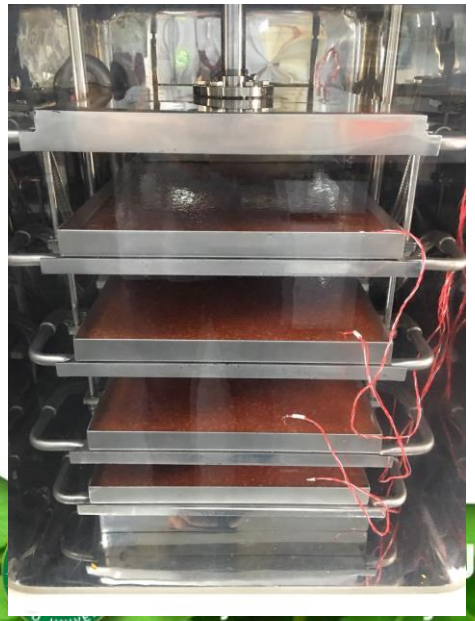
Step 3: Concept Testing

- **Do your sums carefully >>** Make sure your idea can be designed, manufactured and delivered within your financial, resource and time constraints

- **Talk to the people who will buy it**
- **Refine your target market**
- **Take time!!!! Don't Rush for this Step**
  - **Drop-error**
  - **Go-error**

Step 3: Concept Testing







LEARNED FROM GO-ERROR !!!!!!





Step 4: Business Analysis

- Estimate your product price
- Identify your product's market potential

Step 5: Product Development

- ❑ Configure and develop a product prototype

Step 6: Test Marketing

- Introduce product into the market to validate the concept before launch



Step 7&8: Commercialization & Review of Market Performance

Objective: Full product launch !!!

Research Areas

Rice Products

- **>> Rice Grain**
- **>> Rice Flour**
- **>> Rice leaf**

Fruit and Vegetable Product

Rice Products: Rice Grain



- A Mental Health Supporting Bowl
- Long Shelf-life without Rancidity
- No need vacuum packaging



GABA Rice

Head Project:
Assist. Prof. Dr. Pratheung Chokeprasert

Rice Products: Rice Grain







Puffed Rice >>
How to puff without FRYING!!



Head Project:
Assist. Prof. Dr. Pratheung Chokeprasert

Rice Products: Rice Grain

"Evaluation of bioactive compound of low temperature plasma treated black glutinous rice for probiotic growth promoter and colorant in yogurt"



Food Research 4 (Suppl. 6) : 35 - 41
Journal homepage: http://www.myfoodresearch.com

FOOD RESEARCH

FULL PAPER

Response surface methodology for the extraction of bioactive compound from black glutinous rice

[1*]Penjumras, P., [1]Wattananapakasem, I. [2]Panjan, W., [3]Panngom, K. and [2]Sornsakdanuphap, J.

[1]Program of Food Technology, Maejo University-Phrae Campus, 54140 Rongkwang, Phrae, Thailand.
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[3]Program of Applied Biology, Maejo University-Phrae Campus, 54140 Rongkwang, Phrae, Thailand.

Factors

- Solvent: Distilled water, **Citric**, Ethanolic-citric
- Temperature
- Time

Rice Products: Rice Grain

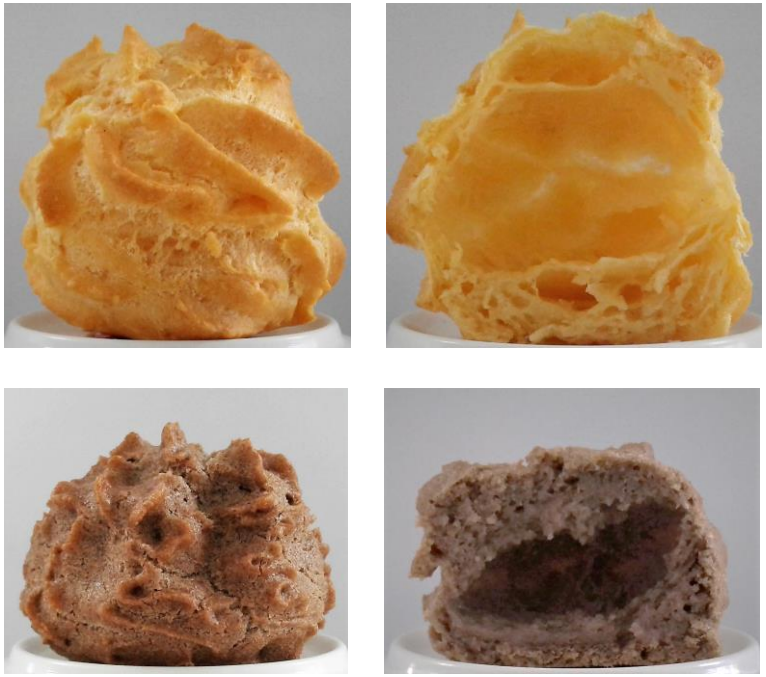






Head Project:
Assist. Prof. Dr. Isara Wattananapakasem

Rice Products: Rice Flour



Gluten-Free Cream Puff

Food Research 3 (2) : 138 - 144 (April 2019)
Journal homepage: http://www.myfoodresearch.com

FOOD RESEARCH

FULL PAPER

Development of gluten-free cream puff with the addition of carboxymethylcellulose and carrageenan

[1*]Penjumras P., [1]Janmeesup, C., [1]Umnat, S., [1]Chokeprasert, P., [1]Wattananapakasem, I. and [2]Phaiphan, A.

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Rice flour,
Bakery product,
Hydrocolloid

DOI:
https://doi/org/10.26656/fr.2017.3(2).133

Abstract

The consumption of gluten-free products is gaining attention since a growing number of people who suffer from celiac disease. However, many gluten-free products currently available in market are of low quality. The objective of this study was to evaluate the effect of the addition of carboxymethylcellulose and carrageenan on physical properties and sensory characteristics of cream puff made with 100% red brown jasmine rice flour. Cream puffs using 1% hydrocolloid at different concentrations of CMC mixed with carrageenan (0.25%+0.75%, 0.50%+0.50%, and 0.75%+0.25%) were developed and compared to a control sample prepared from wheat flour. The results showed that the use of rice flour reduced the effects of all physical properties and sensory characteristics. Compared to control, cream puff made with rice flour had a lower specific volume and darker. However, the incorporation of 0.50% CMC mixed with 0.50% carrageenan presented quality attributes similar to that of the control sample due to hydrocolloids act as polymeric substances that should mimic the viscoelastic of gluten. Therefore, it is feasible for gluten-free cream puff application.

Rice Products: Rice Flour





Gluten-Free Brownies

Rice Products: Leaf











"Rice Leaf Tea"

มหาวิทยาลัยแม่โจ้
Maejo University

Head Project:
Assist. Prof. Dr. Isara Wattananapakasem

Vegetable Product





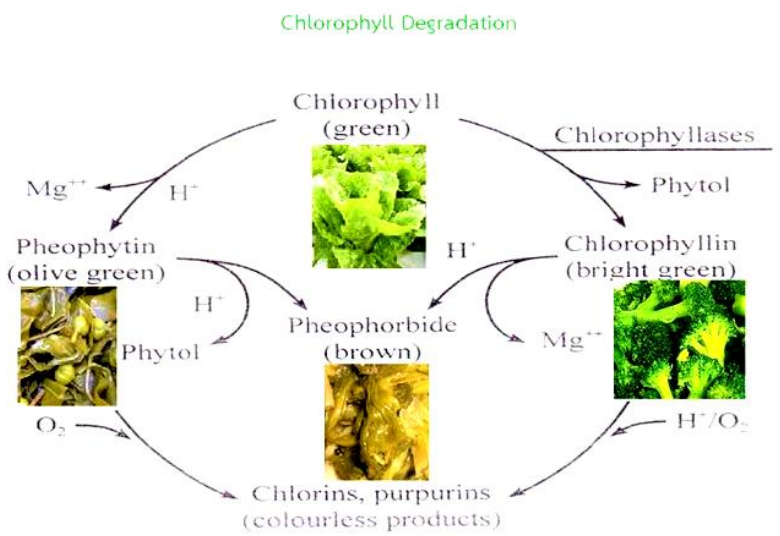


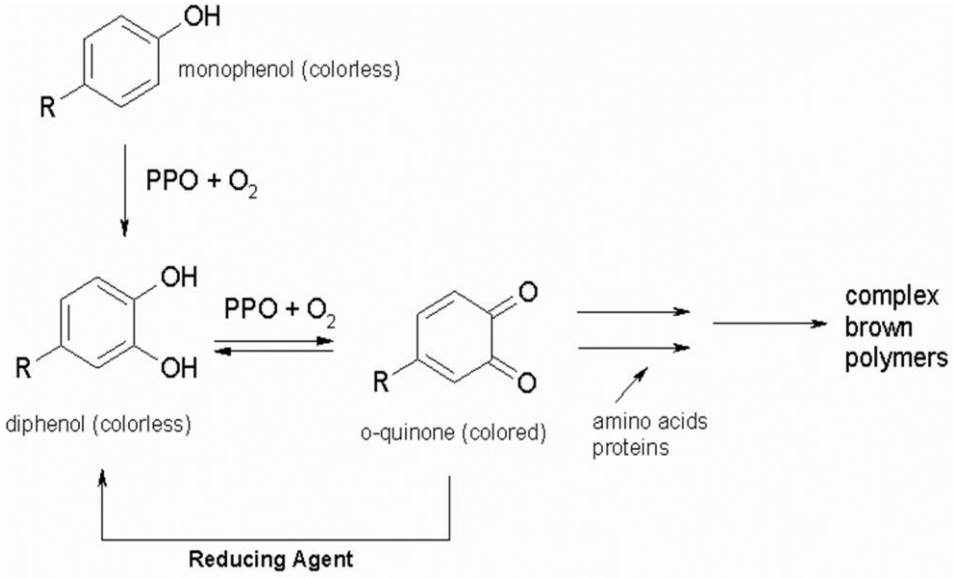
Problems:

- **Color change**
- **Phase Separation**

Head Project:
Assist. Prof. Dr. Isara Wattananapakasem

Vegetable Product: Color change





Chlorophyll Degradation

Enzymatic Browning

“Sodium Chloride”

Vegetable Product



Control

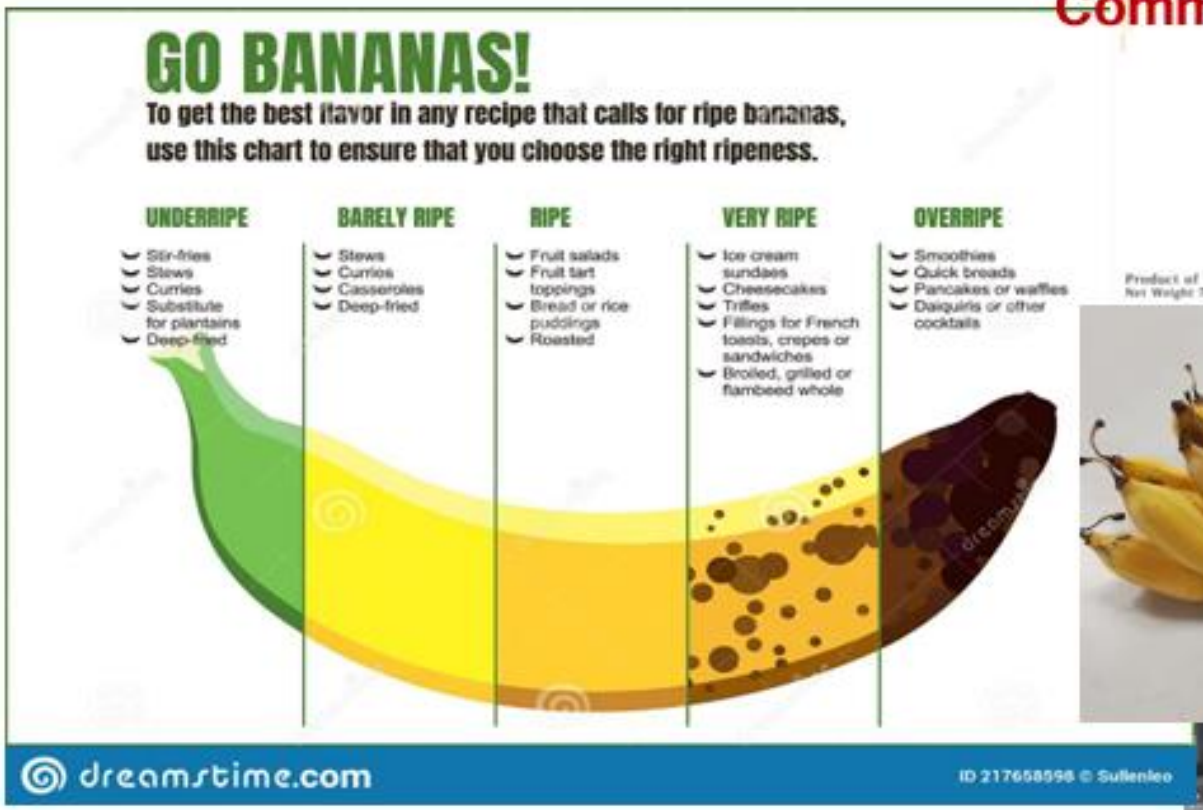


0.3% CMC





Fruit Products: Banana



Commercial product



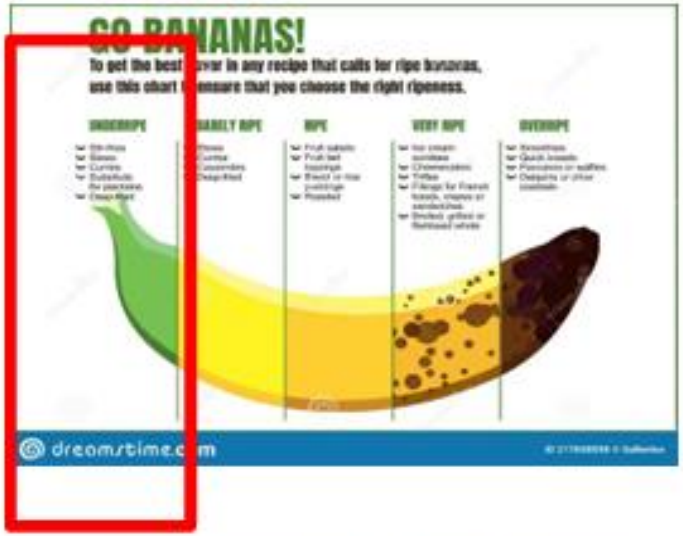




https://www.dreamstime.com/to-eat-banana-usage-chart-different-recipes-products-varying-ripeness-characteristics-unripe-ripe-overripe-image217658598

Our product

Fruit Products: Banana Noodles

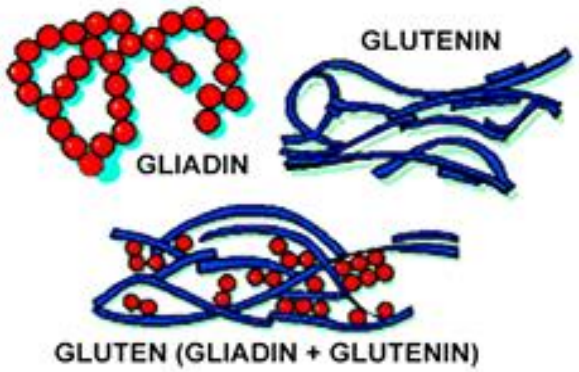








100% Banana flour couldn't produce noodles due to lack of gluten



https://breadscience.weebly.com/gluten-structure.html

Fruit Products: Banana Noodles









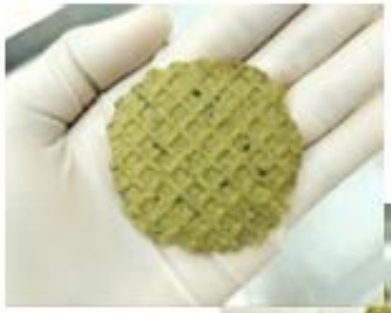
Acceptable products

1. Replacement of wheat flour with 30% banana flour for noodles production
2. 100% banana flour for cookies

Wolffia Products







Thank You Very Much for Attention



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