



FIXATED ON FRESHNESS

This is Sustainable Nutrition

Multi Technology Approach
in Tortilla, Naan, Pita

Clean Label Formulation Challenges

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Dr. Srivastava is the Business Development Manager for Bakery Technical Services at Kerry Ingredients, collaborating with baking industry clients on emulsifiers, enzymes, preservation, taste, health, and clean label ingredients. Previously, she led Anya Baking Lab until May 2024, offering consulting and education in bakery innovation and formulation. Her background includes roles at Kemin, GC Ingredients, and Dabur Research Foundation in product development. She holds a PhD and MS in Food Science from the University of Georgia and an MS in Food Technology from GBP University, India.



On this session

Kerry´s Holistic Approach into Freshness

Flat Bread Types and Characteristics

Clean Label & its Components

Dough Rheology

Freshness and Texture

Mold-Free

Process In-Brief & Base Formulations

Tortilla, Naan, Pita

Case Studies



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THE HOLISTIC APPROACH

How we deliver
Bakery Freshness



MASTER THE FEATURES OF FRESHNESS

Make that 'just baked' appeal last longer and taste better by approaching bakery freshness holistically to meet consumer expectations and secure greater market share.

MOLD FREE

Longer lasting, minimal waste



TEXTURE

Freshly baked experience throughout



TASTE

Taste triumphs in every bite



UNRIVALLED MULTI TECHNOLOGY APPROACH CAN ENABLE YOU TO

- Deliver high quality product performance over shelf life, while minimizing food waste.

FLATBREADS

Types & Characteristics





Tortilla remains the dominant segment

Flat Bread Types and Characteristics

(Pita, Naan, Tortilla/Roti/Lavash)

Pita



Uniform toast points

Open crumb structure

Open Pocket

Naan



Even scorched marks

Soft and uniform crumb structure

Tortilla/Roti/Lavash



Regular edges

Tortilla/Roti/Lavash



No Sticking

Loose

No zippering

No stickiness

No peeling

Tortilla/Roti/Lavash



Soft, pliable

Good foldability

Good Flexibility

No breaking/Cracking

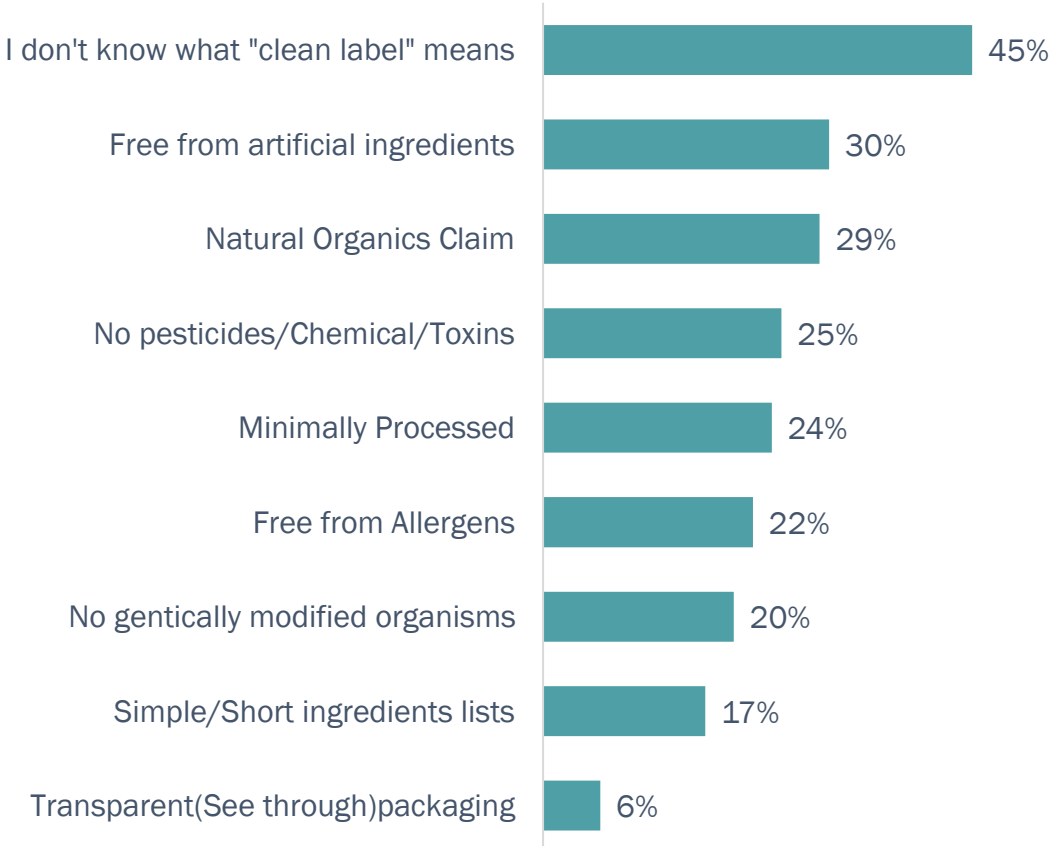


CLEAN LABEL & ITS COMPONENTS



What is clean label?

Consumer insights about clean labelling

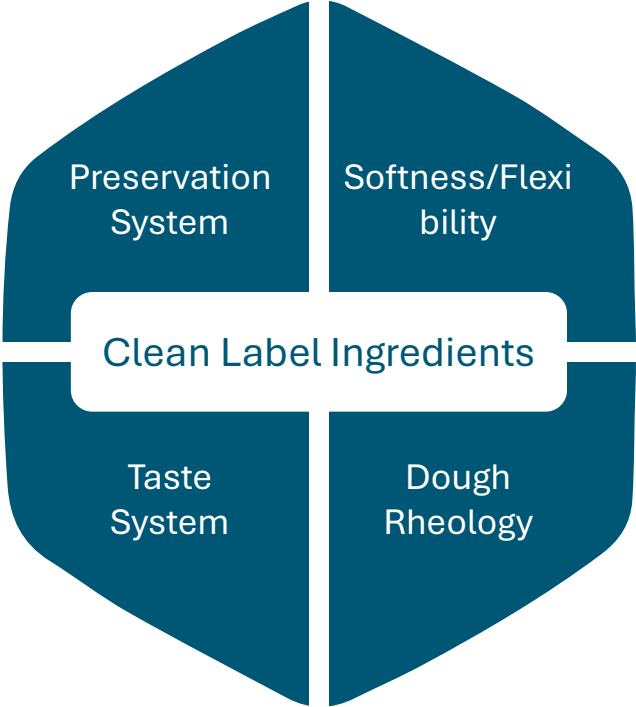


No regulatory or legal definition
A consumer driven movement



Fermented flour
Acidulants

Premature Mold



Natural Flavors
Extracts

Off Taste
Acetic flavors/Vinegary notes
Bitter notes

Amylases
Xylanases
Phospholipases

Retrogradation (Staling)
Cracking/breaking

Proteases
Xylanases
Phospholipases

Dough Relaxers
Dough Strengtheners



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DOUGH RHEOLOGY

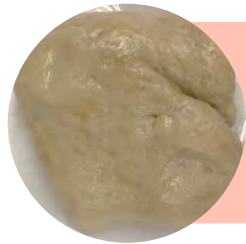
Challenge: 1



Formulation Challenges: Dough Rheology

Designing the dough conditioner/Improver

Soluble Fiber @ 1.5 %:
Hydration = 23.4%

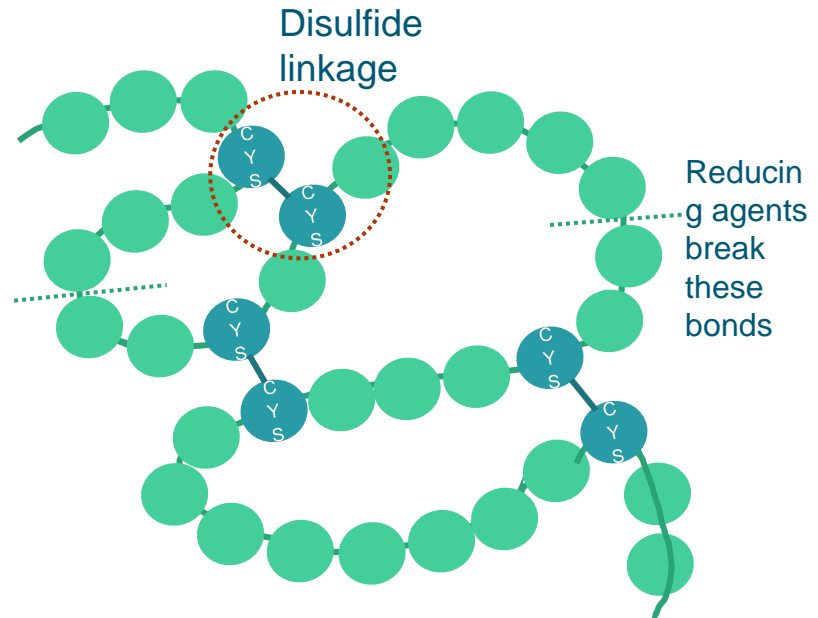


Dough Development & Stability

Water Absorption Capacity
Particle Size



**Dough Relaxers
Dough Rheology**



Reduce dough elasticity, improves water absorption, improves softness, dough machinability, reduce mixing time



TEXTURE

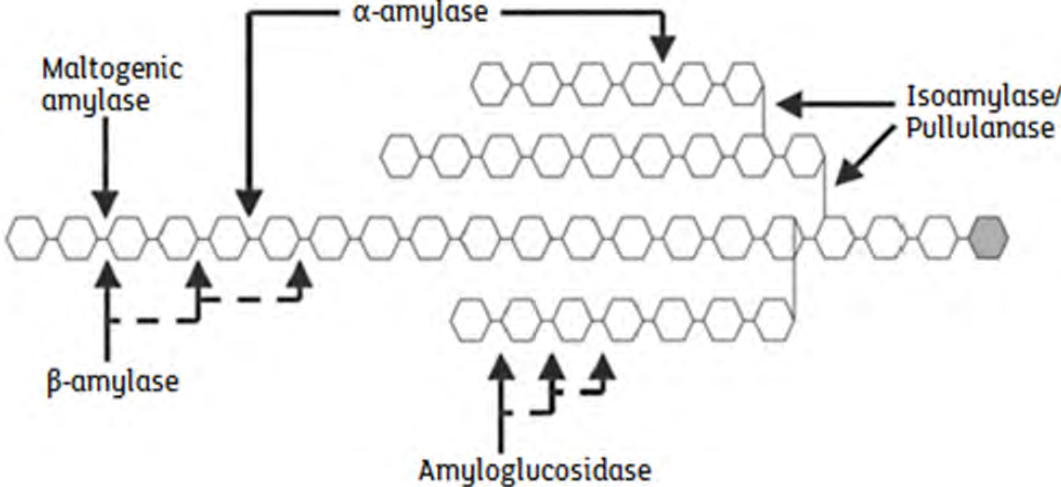
Challenge: 2

Freshly Baked Experience
From First to Last Bite



Enhance Shelf Life

- Softness
- Resilience
- Flexibility

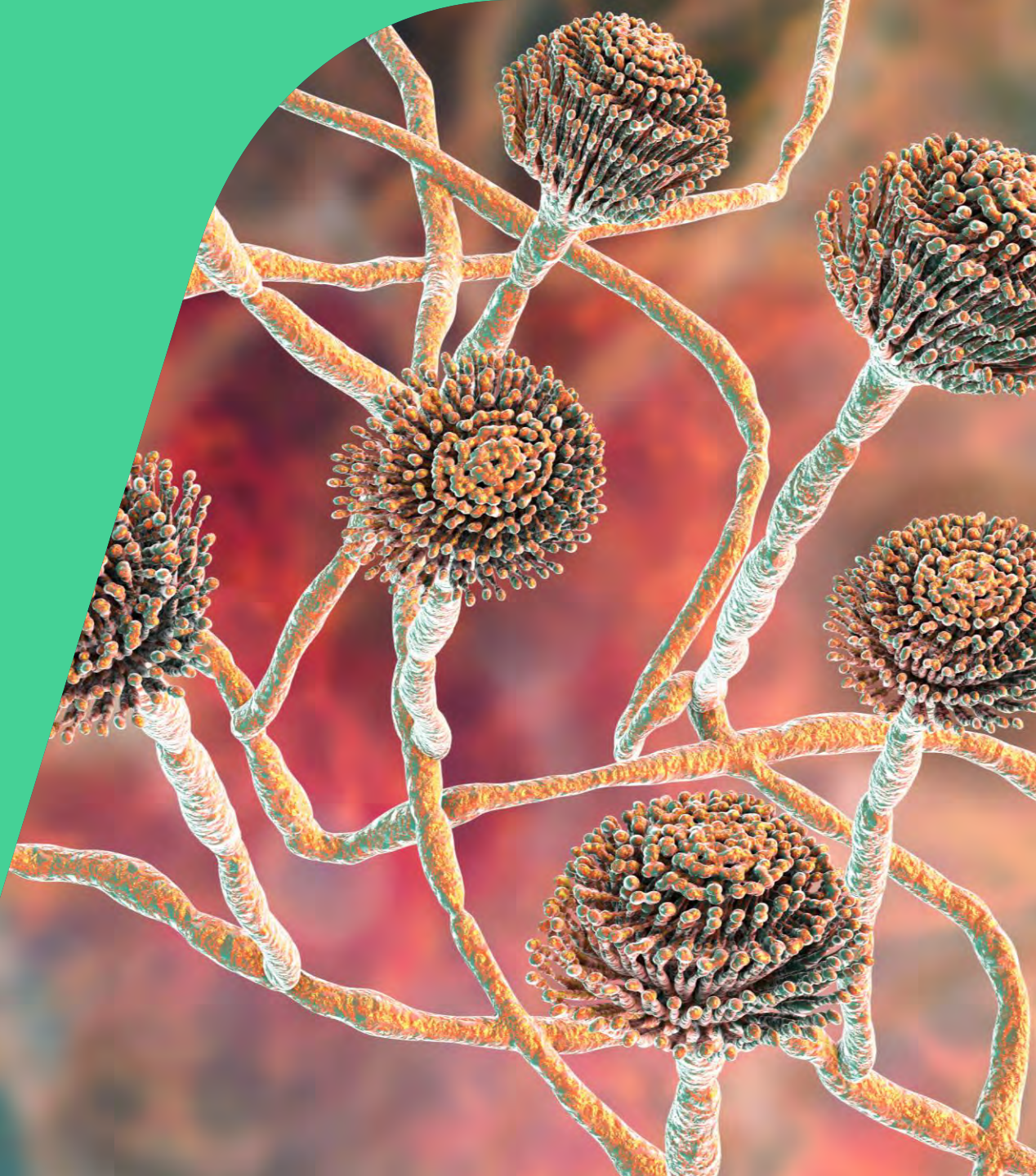


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MOLD FREE SHELF-LIFE

Challenge: 3

Freshly Baked Experience From
First to Last Bite



Mold Free Shelf-Life

Flat Bread is Perfect Heaven for Mold

- Excellent Nutrition Source
- Moisture Content = 30-50%
- pH = 4.8 -6.0
- $a_w = 0.80-0.95$

Antimicrobial and Acidulants Optimised Dosing

- Flavor
- Yeast Activity
- Texture



PROCESS IN BRIEF

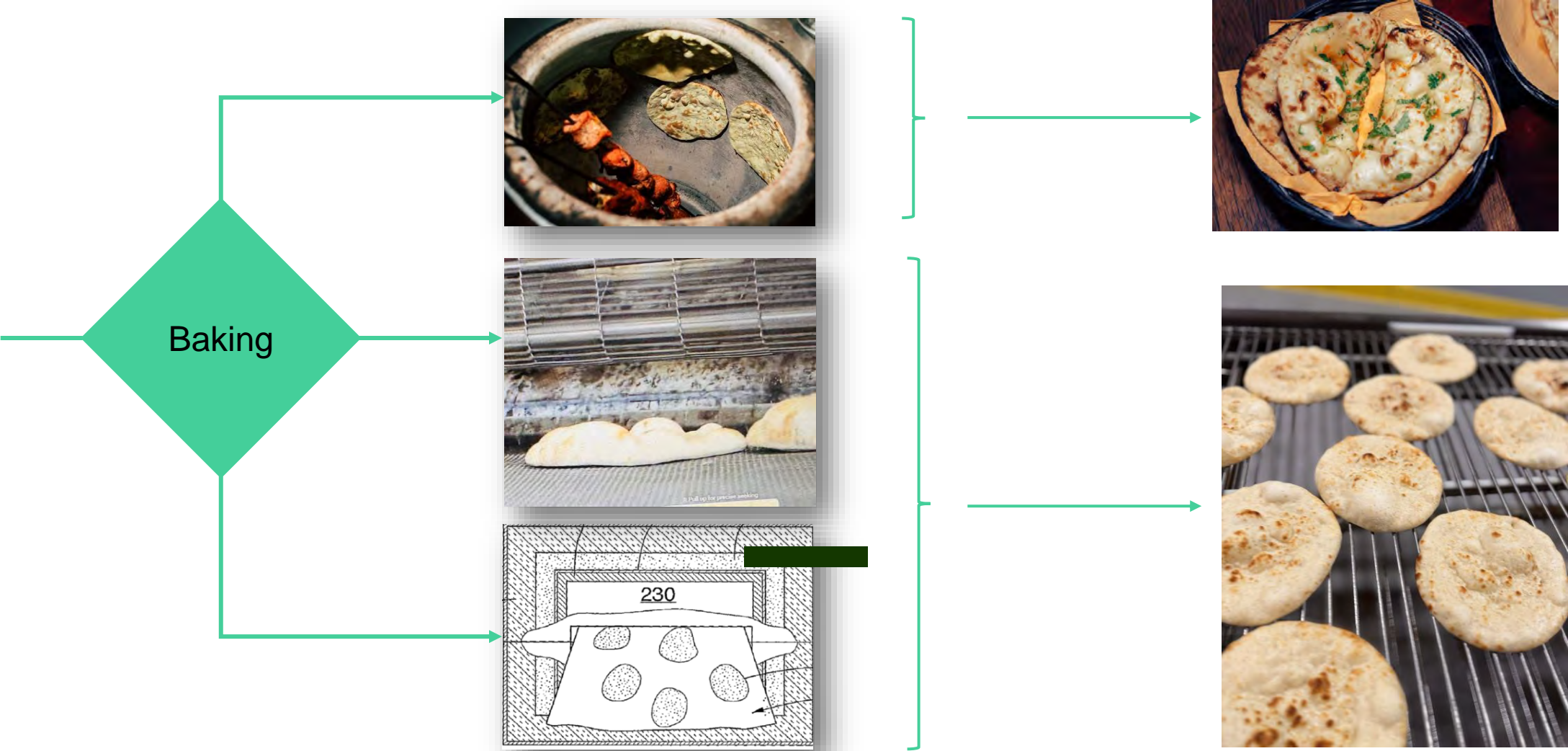
Tortilla, Naan, Pita



Scale-Up Run



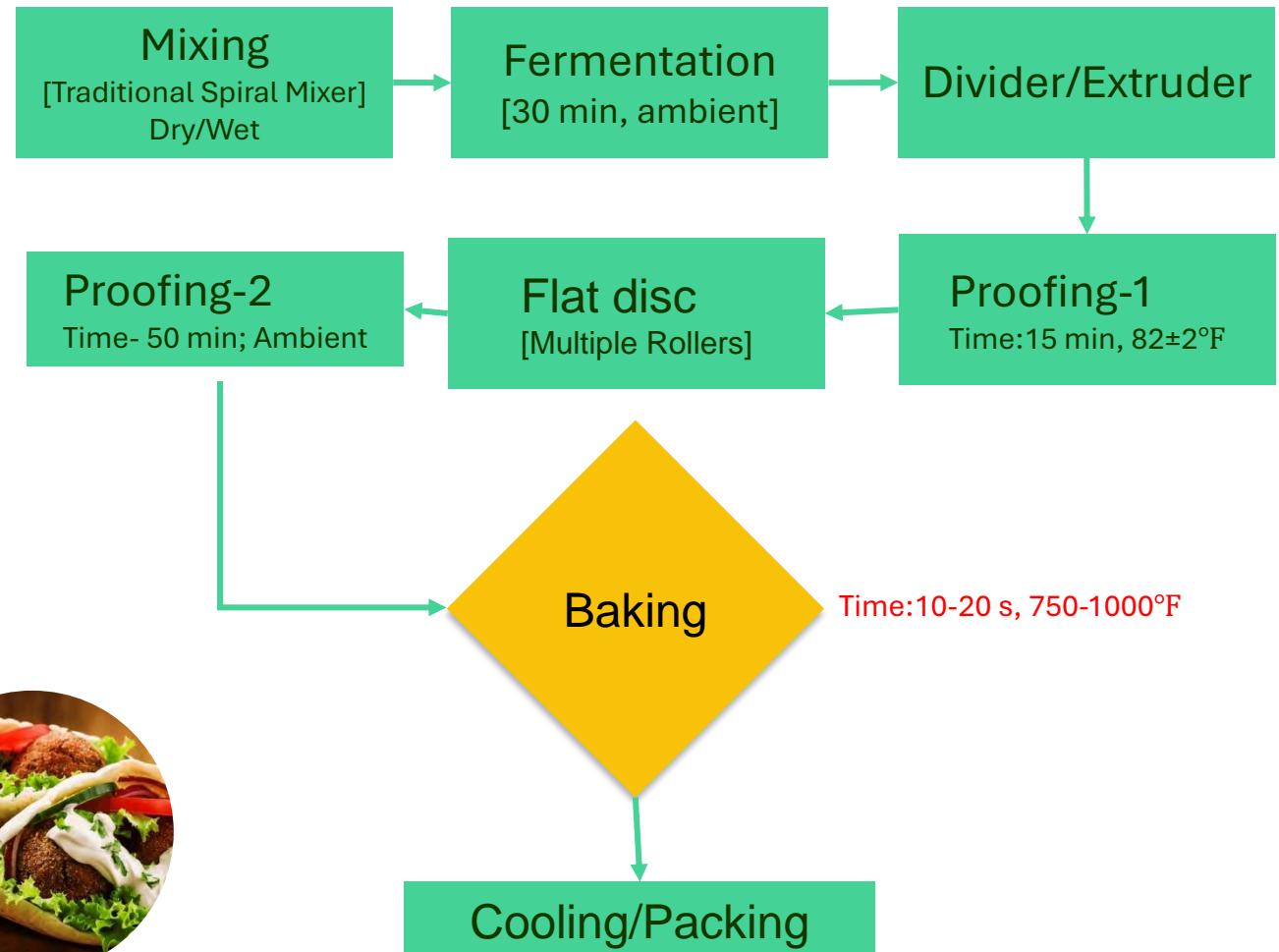
Naan Formulation



Pita-Double Layered Bread

A good Pita Characteristics:

- A clean separation of top & bottom layers
- Softness, resistance to cracking/breaking
- Good tearing quality
- **Quality is measured as Score [1-5] with size/number of blister**



Pita-Double Layered Bread

Die-Cut: High-Capacity Lines



Texture is critical part of the Pita bread. Anti-microbial and Taste is major challenge.

CASE STUDIES



Case Study 1

Clean Label Tortilla-Ingredients

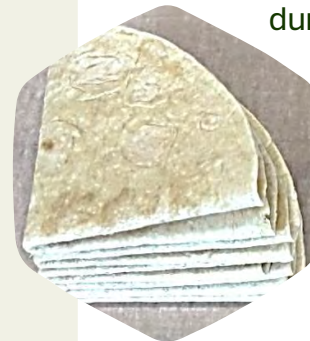


APPROACH

Reformulation : Multi technology Approach

Selection of clean label preservation technologies with modified taste profile.

Process engineered Acacia gum and enzyme systems helped to **reduce stickiness while maintaining desired folding performance and softness over shelf life.**



IMPACT

- Tortilla freshness life : 30 days
- Upgrade™ ProW5 demonstrated highly effective mold control with clean taste profile
- Puremul™ supported provided ant sticking properties in tortilla
- Biobake™ Fresh FBT to reduce the rate of retrogradation / staling for fresh-keeping during storage

MULTI TECH SOLUTION

Preservation

- Upgrade™ Pro W5

Emulsifiers

- Puremul™

Enzymes

- Biobake™ Fresh FBT
- Biobake™ BPN

CUSTOMER CHALLENGE

- Premature Mold Growth
- Stickiness in Tortilla
- Dry Texture/cracking
- 20-25% Reduction in sales
- Tortilla return of distribution center
- Poor consumer experience

Case Study 3

Clean Label Naan



CUSTOMER CHALLENGE

- Premature Mold Growth
- Dry Texture/Poor Crumb Structure
- Flavor profile was not acceptable
- Poor eating experience with dry/hard texture and poor taste profile
- **15-20% wastage due to premature mold growth and off taste**

APPROACH

Reformulation : Multi technology Approach

Selection of clean label preservation technologies with modified taste profile.
Softness enzyme for **performance and softness over shelf life**
Natural Sponge& Dough Type Flavor

IMPACT

- Naan freshness life : 21 days
- Upgrade™ ProW5 demonstrated highly effective mold control with clean taste profile
- Biobake™ Fresh 2500 to reduce the rate of retrogradation / staling for fresh-keeping during storage
- Natural Sponge& Dough Type Flavor



MULTI TECH SOLUTION

Preservation

- Upgrade™ Pro W5

Enzymes

- Biobake™ Fresh 2500

Taste

- Natural Sponge& Dough Type Flavor

Case Study 2

Clean Label Pita



CUSTOMER CHALLENGE

- Premature Mold Growth
- Dry Texture/Poor Crumb Structure
- High Mixing time /Minimal efficiency
- High Cost of production
- Poor eating experience with dry/hard texture
- 15-20% market return due to premature mold



APPROACH

Reformulation : Multi technology Approach

Selection of clean label preservation technologies with modified taste profile.

Softness enzyme for **performance and softness over shelf life**

Dough relaxing enzymes to improve mixing efficiency by reducing the mixing time

IMPACT

- Pita freshness life : 24 days
- Upgrade™ ProW5 demonstrated highly effective mold control with clean taste profile
- Biobake™ Fresh FBT to reduce the rate of retrogradation / staling for fresh-keeping during storage
- Biobake™ BPN helped to reduce mixing time by ~25%



MULTI TECH SOLUTION

Preservation

- Upgrade™ Pro W5

Enzymes

- Biobake™ Fresh FBT
- Biobake™ BPN

Overcoming Challenges in Clean Label Flat Breads



Key Takeaways:

Optimal dough development is key to get desired finished product texture



Enzyme system (i.e., multienzyme system) will have collecting effect than the single enzyme alone



For freshness follow **Multi-technology approach** i.e., Three pillars of formulation .

**Texture
Taste,
Mold-Free**



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**THANK
YOU**

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Discover more at [kerry.com](https://www.kerry.com)

