Allied Blending

The natural choice for food solutions

All the Latest About Gluten-Free

Matthew Buss

Jennifer Hernandez

November 11, 2025

Orlando, Florida

What We'll Cover Today

- Introduction – Why Gluten-Free?
- Regulatory Framework
- Development Objective & Formulation Design
- Processing Considerations

What is gluten and why Gluten-Free?

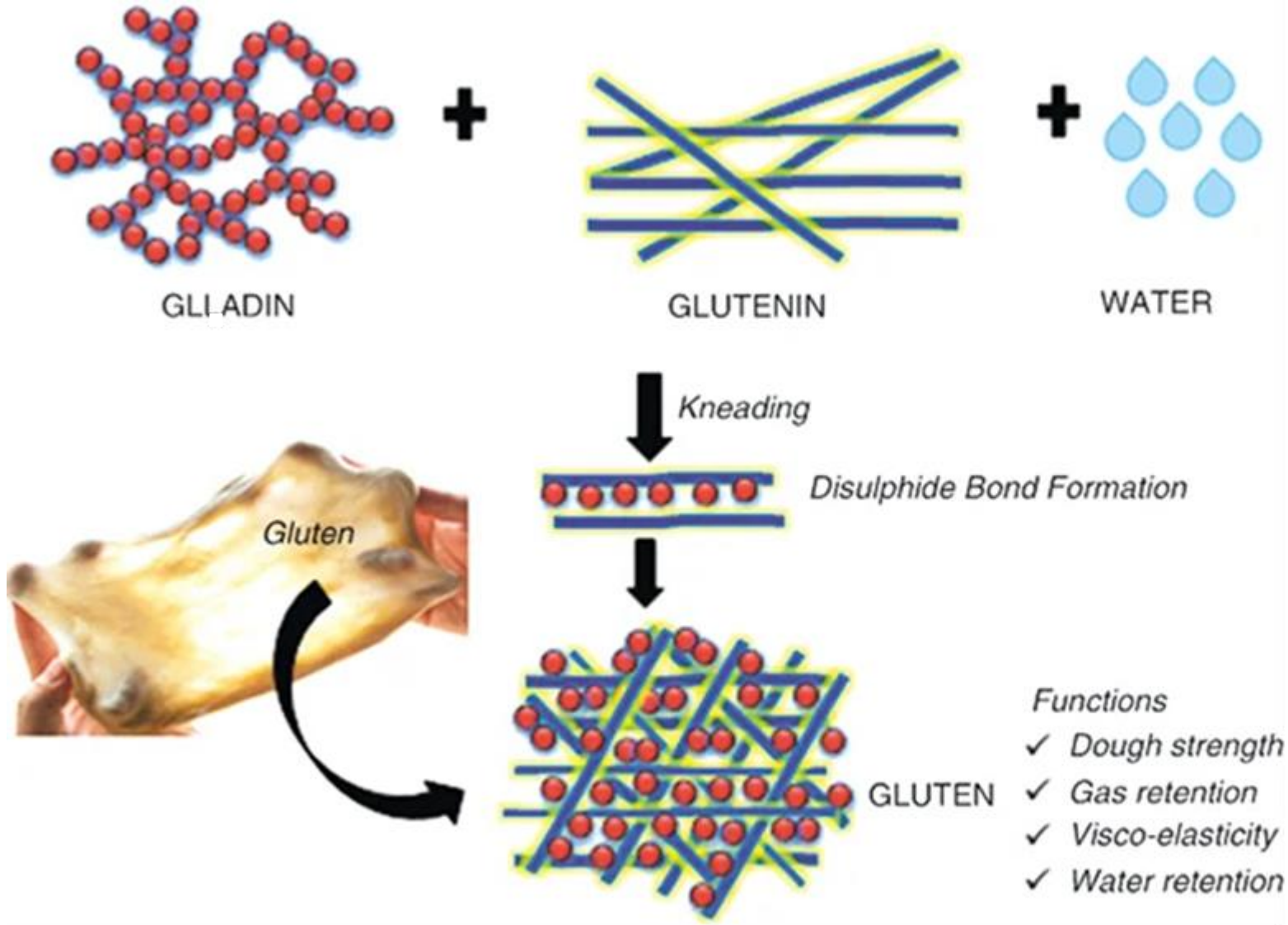
What is Gluten?

- The term “gluten” refers to the storage proteins that naturally occur in a gluten-containing grain. Examples of such proteins are called “prolamins” and “glutelins.”
- These proteins store nutrients for the seeds used during germination.
- In baked goods, these proteins add viscosity and elasticity to dough and allow for gas retention.
- Consumption of gluten by individuals with celiac, can cause various types of health concerns.

Gluten-Containing Grains

- Wheat
- Rye
- Barley
- Crossbred hybrids of the above

What is gluten and why Gluten-Free?



https://millermagazine.com/blog/chemical-structure-of-gluten-5601

What is gluten and why Gluten-Free?

Why gluten-free?

- For people with Celiac Disease, foods that contain gluten trigger production of antibodies that attack and damage the lining of the small intestine. Such damage limits the ability of people with celiac disease to absorb nutrients and puts them at risk of other very serious health problems, including nutritional deficiencies, osteoporosis, slow growth, and intestinal cancers. It can also cause "atypical" impacts to other part of the body.

- An estimated 3 million people in the United States have celiac disease. This is less than 1% of the US population.

Why Gluten-Free?

- **Healthy Perception of Gluten-Free Products?**
  - **Better for you**
  - **High fiber**
  - **Vegan**
  - **No artificial colors**

INGREDIENTS: Water, Modified Food Starch, Rice Flour, Vegetable Shortening (Interesterified and Hydrogenated Soybean Oils), Pea Protein, Resistant Corn Starch, Potato Extract, Tapioca Starch, Sugar, Potato Starch, Sucralose, Cellulose Gum, Guar Gum, Xanthan Gum, Salt, Monoglycerides, Dextrose, Calcium Propionate (to preserve freshness), Baking Soda, Inulin, Sodium Acid Pyrophosphate, Tapioca Flour, Millet Flour, Fumaric Acid, Sorbic Acid (to preserve freshness)

Why Gluten-Free?

- **Healthy Perception of Gluten-Free Products?**
  - **Better for you**
  - **High Fiber**
  - **Vegan**
  - **Grain Free**

INGREDINETS: WATER, ROASTED CHICKPEA FLOUR, MODIFIED FOOD STARCH, CANOLA OIL, INULIN, PEA PROTEIN, XANTHAN GUM, CONTAINS 1% OR LESS OF: SALT, BAKING SODA, SODIUM ACID PYROPHOSPHATE, GUAR GUM, CELLULOSE GUM, MONO- AND DIGLYCERIDES, FUMARIC ACID, ENZYMES, AND CALCIUM PROPIONATE AND SORBIC ACID (TO PRESERVE FRESHNESS).

Why Gluten-Free?

- **Healthy Perception of Gluten-Free Products?**
  - **Non-GMO**
  - **Grain Free**
  - **Vegan**
  - **No preservatives**

INGREDINETS: Almond flour, tapioca starch, water, sea salt, xanthan gum.

Gluten-Free Standards – US Government

FDA Gluten-Free Labeling - ***21 CFR § 101.91 "Food labeling: Gluten-free labeling of foods"***

- **Labeling of gluten free is a voluntary claim. To be labeled "Gluten-Free," a food must:**
  - **Contain less than 20 parts per million (ppm) gluten.**
  - **Be either naturally gluten-free, or if made from a gluten-containing grain (e.g., wheat, rye, barley), it must be processed to remove gluten and verified to meet <20 ppm gluten.**
  - **Twenty ppm gluten is a concentration level rather than an absolute quantity of gluten in a food. It is equivalent to 20 milligrams of gluten per 1 kilogram (or 1000 grams (g)) of food.**

- **The FDA does not require manufacturers to test each batch of product, but they must be able to demonstrate compliance (through testing, ingredient specs, or process controls)**

If a product labeled "gluten-free" contains ≥20 ppm gluten, it's considered misbranded under the Federal Food, Drug, and Cosmetic Act (FD&C Act).The FDA can issue warning letters, product recalls, or injunctions.

Gluten-Free Standards – US Government

- **Labeling**
  - No requirements for the “gluten-free” designation on package labeling such as size color or location on package
- **Testing**
  - No requirement on testing method or frequency.
  - Recommendations include: testing ingredients, requesting certificates of gluten analysis, and participating in 3rd party certification programs
- **Non- Compliance**
  - Products deemed non-compliant would be “misbranded” under the Federal Food, Drug, and Cosmetic Act, and FDA could take regulatory action.

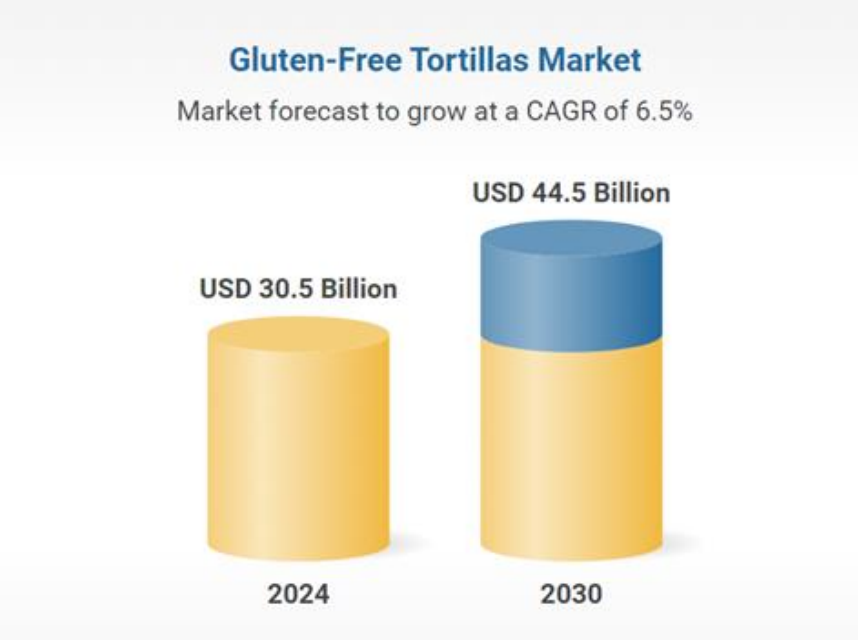
- **The FDA has an excellent eight page Small Entity Compliance Guide for Gluten Free Labeling of foods**
  - https://www.fda.gov/media/88857/download?attachment

Gluten-Free Standards – 3rd Party

- **GFCO – The Gluten-Free Certification Organization (GFCO)**
  - Third Party organization that provides manufacturing and branding standards for gluten free ingredients and products.
  - Has segregation requirements similar to allergens.
  - Gluten-Free: The presence of Gluten at **10 parts per million ("ppm")** or less, or the regulatory threshold of the country of sale, whichever is lower.
  - GFCO certification can be granted to Products in the categories of Food, Beverages, Nutritionals/Supplements and Personal Care. GFCO certification is specific to a Product made under a specific Brand at a single Plant or set of Plants. Each Plant must comply with the GFCO Standard requirements

Gluten Free's Relevance in the tortilla market

- Global GF Tortilla market is expected to grow at a compound annual growth rate of 6.5% from 2024-2030
- Consumer Demographics & Trends
  - Medically driven Consumers (Celiac Disease)
  - Lifestyle buyers
  - Influenced buyers (social Media)
- Nutritional & Sensory expectations
  - Products with nutritional claims perform well with health oriented buyers, but claims must be balanced against mouth feel and rollability



https://www.researchandmarkets.com/report/gluten-free-tortillas
https://www.sciencedirect.com/science/article/pii/S2772502223001208

Development Objective & Formulation Design

- **Objective:** Achieve a gluten-free dough system that can be divided, pressed, and baked without tearing or cracking, and remains pliable post production
- **Challenge:** Absence of gluten means no elastic protein network that sustains moisture to support extensibility
- **Approach:**
  - Incorporate Hydrocolloids (Guar gum, Xanthan gum) to mimic gluten's elastic and water binding properties
  - Use starch blends (Tapioca starch, modified corn starch) to improve dough cohesiveness and flexibility post bake
  - Fine tuning fat content (Shortening, oil etc) to lubricate the dough and enhance the flexibility post bake

Processing Conditions

Mixing

- **Goal:** Develop a homogenous dough with correct water distribution and network formation from starches, hydrocolloids, and proteins in your formula
- **Hydration:** Hydration strongly interacts with type and level hydrocolloids and starches.

Too little water	Too much Water
Dry, Crumbly dough	Sticky, Hard to sheet or press
Poor starch gelatinization	Loss of structure during press
Cracks upon rolling and folding	Excessive moisture loss during bake
Reduced flexibility	Weak structure

Processing conditions

- **Dough Texture**
  - **Gluten Free:**
    - Consistency similar to clay
    - Moldable
    - Not as elastic as elasticity flour based dough
  - **Conventional dough**
    - Stretchy
    - Viscoelastic

Processing conditions

Dividing and Rounding

- **Goal:** Create uniform dough portions that are ready for pressing.
  - Consistent weight and size of tortillas
  - Predictable spread ratio during pressing
  - Improved dough handling during transfer

Common issues and troubleshooting	
Issue	**Possible cause**
Cracked dough balls	Under- hydration
Sticky dough	Over-hydration or insufficient gums
Uneven dough ball weight	Poor divider calibration

Processing conditions

Resting time

- **Goal:** Allow hydration, viscosity stabilization, and moisture equilibrium in dough.
  - Helps in the following mechanisms:
    - Hydration equilibrium
    - Viscoelastic stabilization
    - Temperature equilibrium

Under resting vs Over resting	
Unrested dough	Sticky surface, uneven thickness
Over-rested dough	Stiff texture, reduced extensibility

Processing conditions

Pressing

- **Goal:** Convert dough into uniform discs without tearing, with consistent thickness & diameter
- **Press Temperature:**
  - Typical range 320-374 °F (160-170°C)
  - Too Low: Dough tears and poor surface finish
  - Too high: Loss of flexibility Excessive drying
- **Press pressure**
  - Sufficient to evenly spread the dough, but not so high that moisture is squeezed out
  - Pressure must be consistent to maintain thickness
- **Press Time**
  - Typical Range 1-2 seconds
  - Long press times can toughen surface

Processing conditions

Pressing

Common Issues and Troubleshooting	
Issues	**Possible Causes**
Tortillas cracking or tearing	Under hydrated dough, press temperature may be low
Sticky dough on plates	Over hydrated dough
Uneven thickness/ roundness	Non-uniform dough ball weight or inconsistent pressure
Dry tortillas	Press temp or dwell time may be too high

Processing conditions

Baking

- **Optimal Temperature:** Approximately 350-400°F (Varies depending on equipment)

Cooling and Post- Bake Handling

- Cool tortillas to ambient Temperature 68-77 °F before packing
- Cooling time: Typically 3-5 min with gentle airflow

Common Issues and Trouble shooting	
Issues	**Possible Cause**
Condensation inside packs	Improper cooling before packing
Sticky Tortillas	Excess moisture or tight stack
Dry/ Cracked edges	Overcooling or long air exposure
Loss of flexibility	Moisture migration during storage

Production Hurdles

- **Cross- contact control with gluten**
  - Shared mixers, presses, and packaging lines retain flour dust or residues

  Control:
    - Dedicate GF line or validate wet-clean/ sanitation processes
- **Sanitation & changeover**
  - Successfully removing GF residues from equipment crevices, belt scrapers, mixers, and dough hoppers is a challenge

  Control:
    - Implement cleaning protocols with validated cleaning agents.
- **Ingredient storage and segregation**
  - Cross contact during receiving and storage

  Control:
    - Separate or label ingredient zones in storage area
- **Equipment compatibility**
  - Standard equipment is intended for gluten based dough consistency.

  Control:
    - Equipment adaptation through test runs

Allied Blending

The natural choice for food solutions

Thank You