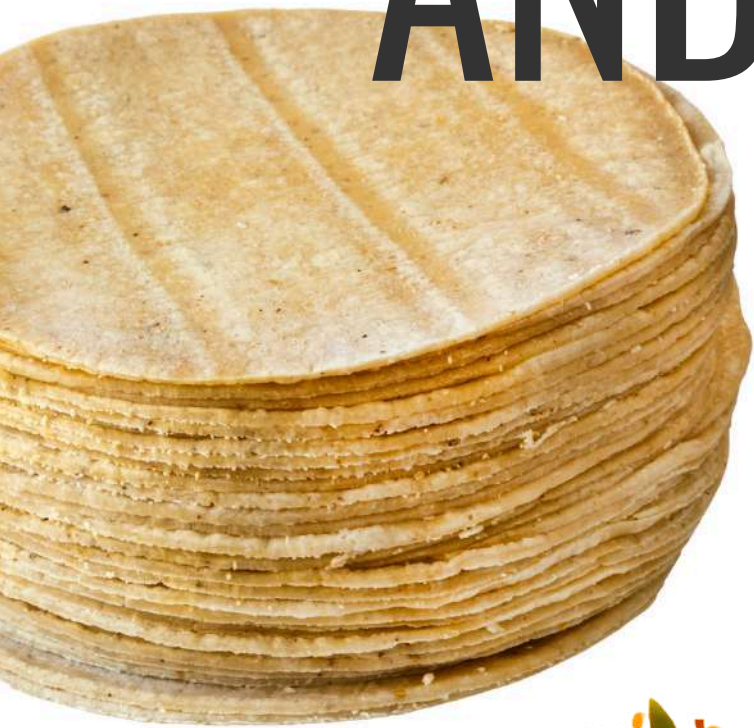


# BAKING TORTILLAS AND WRAPS



*BAKERpedia*  
*Pocket Guide*  
V 1.1





*BROUGHT TO YOU BY*

---

 **Vantage® | Food**



**GRAIN MILLERS**

  
**Ingredion.**

 **K P M**

# Table of Contents

---

- 5     **Introduction**  
Market Trends and Opportunities
  
- 6     **What are tortillas and wraps?**  
Definition, Types/Variations
  
- 8     **Ingredients**  
Flour, Water, Sugar, Fat and Yeast
  
- 15    **Tortillas Processing**  
Processing of wheat flour tortillas and corn tortillas
  
- 17    **Tortillas Formulation**  
Formulation of tortillas
  
- 21    **Quality of Tortillas**  
Quality parameters and measuring techniques
  
- 26    **Troubleshooting Tortillas**  
Problems and Solutions
  
- 29    **Summary & References**

**ALL THE INGREDIENTS  
YOU NEED TO MAKE**  
*Good Happen*



Use Grain Millers' oat fiber to boost the nutrition and functionality of your formulations, while reducing overall cost. Our technical experts are ready to help with a custom solution to meet your needs.

**Contact us today at [GrainMillers.com](http://GrainMillers.com) or  
541-341-6461**



**GRAIN MILLERS**

# INTRODUCTION

Tortillas and wraps have taken over the baking industry and are becoming a staple in kitchens worldwide. Due to the low-carb trend, many restaurants are offering wrap alternatives to sandwich bread and buns. Quick-service restaurants are also increasing their wrap offerings due to its portability and convenience. Tortillas and wraps are made from a mixture of water and flour with the addition of other ingredients such as fat, salt, emulsifiers, or enzymes.

Tortillas, just like other baked goods, have health-conscious consumers looking for gluten-free, clean-label, and keto alternatives. The market size of tortillas is valued at USD 37.7 billion in 2024 with a projected growth up to USD 57.7 billion by 2032 with a CAGR of 5.45% during the 2024 - 2032 period.<sup>1</sup>



**Ingredion.**  
Be what's next.

Explore insights  
and solutions  
for tortilla  
formulation  
success

Download  
solutions guide



## Tortilla Market Opportunities

- ▶ The tortilla market is constantly growing and has a current market value of **USD 37.7 billion in 2024** with a projected growth up to **USD 57.7 billion by 2032** with a **CAGR of 5.45%** during the **2024 - 2032 period**.
- ▶ Novel health trends like gluten-free, keto, and clean-label have caused the source of novel ingredient technology to satisfy consumers' demands.
- ▶ Novel current trends are surging due to the consumer's interest in healthier baked goods.

Market Research Future, <https://www.marketresearchfuture.com/>. Tortilla Market Size, Share, Industry Analysis, Report, 2032, [www.marketresearchfuture.com/reports/tortilla-market-2419](https://www.marketresearchfuture.com/reports/tortilla-market-2419). Accessed 21 Apr. 2024.



**Wrap,  
Bite &  
Delight!**

Vantage | Food

Tortilla Shortening

# WHAT ARE TORTILLAS AND WRAPS?



## Tortillas

Tortillas are unleavened baked products made from either corn or wheat flour with added water to produce a dough that is flattened into a circular shape. They are traditionally from Latin America, especially from Mexico.<sup>2,3</sup>

They are used to make a wide variety of dishes ranging from tacos to quesadillas and wraps.

## Types/Varieties

- **Wheat flour tortillas:** are produced from refined or patent flours and can be either yeast-leavened or chemically leavened. These tortillas have a thickness of 2–3 mm and diameters that vary from 15 to 33 cm. Most wheat tortillas are industrially produced by hot-presses or die-cut processes.<sup>2,3</sup>
- **Corn Tortillas:** are made with a fresh masa or “whole corn dough” following a Nixtamalization process. During this process, corn kernels are treated with an alkali like calcium hydroxide, steeped, and cooked. It is then ground, to produce masa—the Spanish word for “dough.” The fresh masa is mixed with other ingredients and sheeted to their desired dimensions.<sup>2,3</sup>



**INGREDIENTS YOU NEED TO MAKE**

*Good Happen*

Boost nutrition and functionality while reducing formulation cost.

LEARN MORE ABOUT OUR OAT FIBER >



GRAIN MILLERS

# Nixtamalization



Nixtamalization is a traditional process used primarily in Mesoamerican cuisine to treat and enhance the nutritional value of maize (corn). This ancient technique involves soaking and cooking the corn in an alkaline solution, usually made from calcium hydroxide (lime) or wood ash, and then hulling the kernels. This process generates several nutritional benefits, improves flavor and aroma, enhances texture and consistency, and finally extends shelf life.<sup>3</sup>

## Wraps

Wraps are a culinary dish made with a soft flatbread or tortillas rolled up around a filling. Wrap fillings vary depending on the consumer's preference, they range from animal protein fillings to vegetables, and everything in between.<sup>2,3</sup>

Wraps are usually made with hot-press tortillas. Hot-press tortillas are smoother in surface texture, have a higher elasticity, and light chewiness. They are also more resistant to tearing and cracking. Further explanation on the hot-press processing will be discussed later. In general, wraps are larger, more resilient, and have a longer shelf that can handle a freeze-thaw process that serves the food service industry.<sup>2,3</sup>



**Better-for-you tortillas with added protein and fewer carbs stand out to consumers on the shelf. Overcome formulation challenges and speed up innovation with Ingredient's consumer and market insights, broad portfolio of clean label ingredients and deep expertise. Discover solutions to deliver delicious tortillas with market-winning performance and appeal: [Download Ingredient's tortilla solutions guide now.](#)**



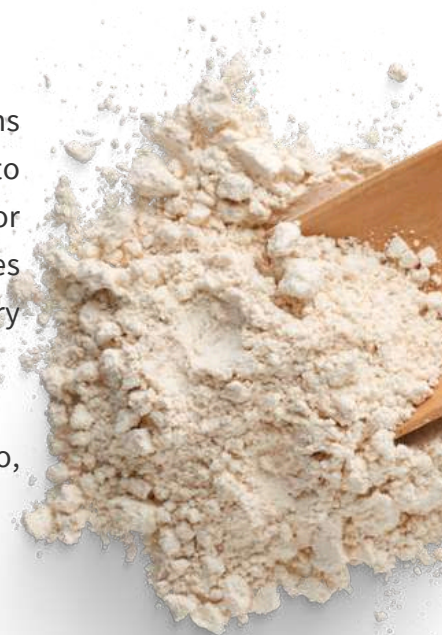
# INGREDIENTS

## All-purpose flour

Flour is the essential building block in the creation of tortillas, playing a pivotal role in shaping their texture, flavor, and structural integrity.

Similarly, flour serves as the key ingredient in traditional wheat-based versions of tortillas. Flour is combined with water and sometimes other ingredients to form a pliable dough that can be rolled out thinly and cooked on a hot griddle or skillet. The gluten in the flour helps to bind the dough together and gives tortillas their flexible yet sturdy structure, perfect for wrapping around savory fillings or serving as a base for tacos, burritos, or enchiladas.<sup>2</sup>

For gluten-free alternatives, [chia flour](#) or psyllium fiber can be used with potato, cauliflower, tapioca, rice, or sorghum flour to form a cohesive dough.<sup>2</sup>



**Ingredion.**

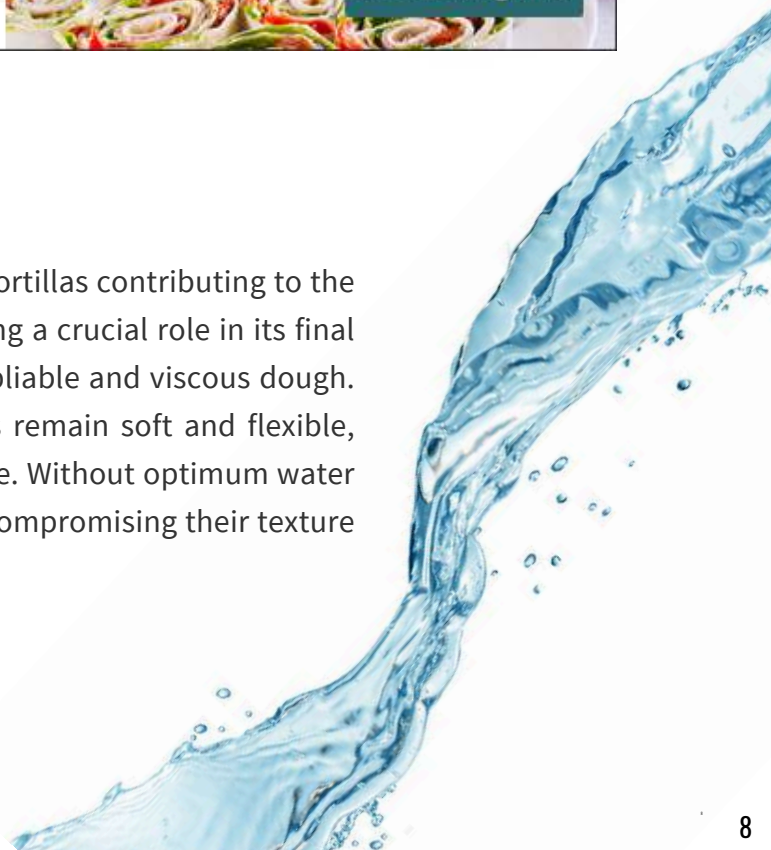
**Deliver more protein and fewer carbs in tortillas**



**Download solutions guide**

## Water

Water is an essential ingredient in the preparation of tortillas contributing to the hydration and elasticity of the dough, as well as playing a crucial role in its final quality attributes. Water combined with flour form a pliable and viscous dough. The hydration of the dough ensures that the tortillas remain soft and flexible, making them easy to roll out and cook on a hot surface. Without optimum water absorption, the tortillas may become dry and brittle, compromising their texture and flavor.<sup>2</sup>





# Fat

Fat, whether in the form of oil, shortening, or lard, serves multiple important roles in the preparation of tortillas. Not only is it a release agent, it contributes to texture, flavor, and overall quality. The addition of fat contributes to the flexibility and pliability of the tortillas, making them easier to roll up without cracking. It enhances the flavor and mouthfeel of the tortillas, giving them a richer and more satisfying texture when cooked. Lastly, fat impedes starch retrogradation, and therefore delays staling, improving the shelf life of the tortilla and wrap.<sup>2,3</sup>



# Leavening

Leavening agents, such as baking powder, bicarbonates, and other acids are frequently used for wheat flour tortilla production. They serve a vital role in the preparation of tortillas, providing a quick and convenient method of achieving leavening without the need for fermentation with yeast.<sup>2,3</sup>

Baking powder, which typically contains a combination of a leavening acid and a base, reacts when mixed with moisture and heat, producing carbon dioxide gas. This gas creates bubbles in the dough, resulting in a softer and lighter texture. Unlike yeast, which requires time to ferment to produce carbon dioxide, chemical leavening agents react immediately, allowing for quick and efficient preparation of tortilla dough.<sup>2,3</sup>

The tortilla production would determine the type of leavening agents used. Production parameters affect the leavening system's choice to obtain the tortillas' desired final characteristics from pH, opacity, dimensions, and texture.<sup>2,3</sup>

Slow-acting leavening acids like anhydrous sodium aluminum phosphate, sodium aluminum sulfate, and sodium acid pyrophosphate-28, used with sodium bicarbonate would produce hot-press tortillas that are more opaque, larger in diameter and thickness.<sup>3</sup>



# Yeast

Yeast is a biological leavening agent, responsible for the production of gas that provides the rise in baked goods.<sup>2,3</sup>

In tortillas, yeast is sometimes used to leaven the dough, although some traditional recipes may rely on chemical leavening agents like baking powder or baking soda. The addition of yeast helps create a light and fluffy texture in the tortillas, making them soft and pliable for wrapping around fillings or serving as a base for tacos and quesadillas. Yeast also provides a fermented aroma with a sour note.<sup>3</sup>



# Emulsifiers

Emulsifiers play a significant role in the production of tortillas, enhancing their texture, softness, extensibility, shelf life, uniformity, and overall quality. The emulsifiers used in tortillas are:

- **Mono- and Diglycerides:** are the most commonly used emulsifiers in tortilla manufacturing. They help improve tortillas' softness and flexibility, making them easier to roll and less prone to cracking. Commonly used at 0.5 - 1.0%.<sup>2,3</sup>
- **Lecithin:** This natural emulsifier acts as a dough conditioner, softening the tortilla and reducing stickiness during processing. It can also enhance gas retention. It is increasingly used due to consumer preferences for natural ingredients. Commonly used at 1 - 2%.<sup>2,3</sup>
- **Sodium Stearoyl Lactylate:** it enhances dough stability, surface texture, dough machinability, and overall texture, contributing to the overall quality of the tortillas. Commonly used at 0.25 - 0.5%.<sup>2,3</sup>



*Satin Gold from Vantage Food is a versatile shortening solution built to promote a softer and smoother texture for tortillas and wraps. It ensures a superior bite enhancing both quality and freshness. [Learn more here!](#)*



# From Fold to Flavor- Tortillas Delight!

Craft excellence in every tortilla with our trans-free **Shortening Solution**, ensuring high-quality results day in, day out!

- **Maintains softer texture**
- **Incorporates emulsifiers for texture enhancement**
- **Elevates taste for a flavorful experience**

Collaborate with our industry experts to find custom solutions for any operations large or small.  
[www.vantagefood.com](http://www.vantagefood.com)

Better Performance  
Made Possible



# Mix reducers or relaxers

Mix reducers or relaxers are used in tortilla making to soften doughs, and improve machinability for high-speed bakeries. They are:

- **L-cysteine:** is an amino acid used as a reducing agent, it aids in gluten breakdown softening the dough. It is commonly used to improve machinability and extensibility.<sup>4</sup>
- **Inactivated yeast:** is a yeast that has been rendered inactive through processes such as heat treatment or pH modification. It contains glutathione, which works similarly to l-cysteine aiding in the relaxing of the dough. It is considered a clean-label alternative to l-cysteine.<sup>5</sup>

# Enzymes

Enzymes can improve dough handling and machinability, as well as enhance mixing tolerances and crumb structure. They can also improve final product shelf-life and are considered a clean-label ingredient.<sup>6</sup>

The most commonly used enzymes in tortilla manufacturing are:

- **$\alpha$ -Amylase:** modifies damaged starch, providing a better structure and retarding starch gelatinization, improving product shelf-life. Usage depends on the nature of the amylase being utilized. Amylase is gelatinized starch-specific. Thus, it's important to consider if fungal or malt  $\alpha$ -Amylase is the best choice. The selection of one variety over the other largely depends on the type of flour used, whether wheat or corn.<sup>6</sup>
- **Hemicellulose:** breaks down complex non-starch polysaccharides that retain water, influencing tortilla flexibility. Water retention is important to prevent starch gelatinization and gluten development, which can produce less flexible tortillas.<sup>6</sup>
- **Oxidoreductase:** oxidizes glucose molecules and produces substances that can increase the elastic properties of dough, helping stabilize the gluten network.<sup>6</sup>
- **Protease:** can be used in wheat flour tortillas to reduce mixing, proofing, and resting times, influencing dough relaxation.<sup>6</sup>
- **Asparaginases:** can aid in the reduction of acrylamide formation, a probable human carcinogen, by removing its developmental precursor.<sup>6</sup>

**Ingredion.**  
Be what's next.

- ✓ Enhance nutrition
- ✓ Boost performance
- ✓ Improve appeal

[Download solutions guide](#)

**Snack Attack,**

**Tortilla Style**

Vantage | Food

Tortilla Shortening

# Fiber

Increased consumer concern with healthier diets has caused the need to produce tortillas with higher nutritional value. One of the alternatives to improve the nutritional quality of tortillas is by increasing the fiber content. Some of the most common reformulations for the improvement of the nutritional profile are: <sup>7,8</sup>

- **Whole wheat tortillas:** Whole wheat tortillas are a good source of fiber, providing around 3-4 grams per serving. They have a slightly nutty flavor and can be used in place of regular flour tortillas. <sup>7,8</sup>
- **Oat fiber tortillas:** Oat fiber tortillas are a low-carb, keto-friendly option that uses oat fiber to boost the fiber content without adding significant carbohydrates. They can be made with a combination of almond flour for a soft, pliable texture. Oats have several health benefits such as anti-inflammatory, antiatherogenic, and antioxidative properties. <sup>7,8</sup>
- **Tortillas with added fiber:** Some tortilla brands add extra fiber to their products, such as cellulose or inulin, to increase the fiber content. However, it's important to note that not all added fibers provide the same benefits as naturally occurring fiber found in whole foods. <sup>7,8</sup>



# Acids

Acidulants are used in tortilla making to adjust pH levels to the appropriate values to improve shelf life stability and the action of some mold inhibitors. <sup>9</sup>

Common acids used in tortilla making are fumaric acid, citric acid, sodium aluminum sulfate (SAS), sodium acid pyrophosphate, sodium aluminum phosphate, and monocalcium phosphate. pH level can affect tortilla properties, dough with a pH of 5.5 or lower presents less elasticity and pliability. Thus, pH affects the machinability of tortilla dough, some acidulants like citric acid can cause the shrinkage of the tortillas, while others like fumaric acid cause an increase in tortilla diameter due to its reducing potential. <sup>10</sup>

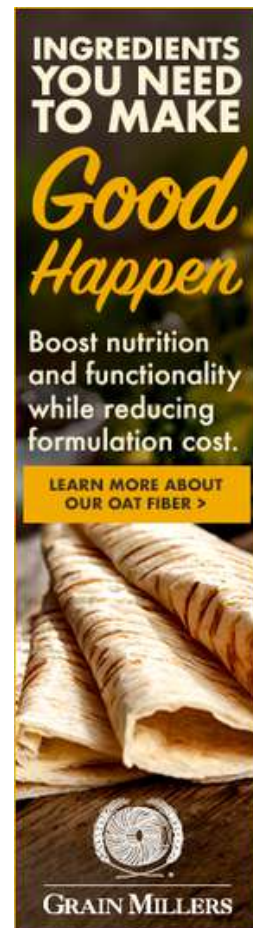
# Mold inhibitors

Mold inhibitors are ingredients that when added can aid the control or elimination of mold in tortillas.<sup>9,10</sup>

- **Sorbic acids and sorbates:** they are recognized anti mold agents, and are generally recognized as safe for usage in food products. The usage level of sorbate in baked goods ranges from 0.0001-0.3%, at this concentration, sorbate does not significantly impact quality. However, higher levels have been shown to affect taste and flavor. Another drawback is the negative effect on yeast, affecting its gas production, and producing sticky dough that it's difficult to process.<sup>9,10</sup>
- **Propionic acids and propionates:** calcium propionate is used to prevent bacterial and mold growth in food products. Usage in formulation can range from 0.003-0.3%. In contrast with sorbates, they can be directly applied to the formulation without affecting yeast activity.<sup>9,10</sup>

*More natural alternatives:*

- **Cultured Wheat:** is a fermented wheat product that contains organic acids, primarily lactic and acetic acid, which inhibit mold growth by lowering the pH. It is typically used at levels of 1% to 5% in baked goods, depending on the desired level of mold inhibition and the product's pH.<sup>9,10</sup>
- **Raisin Juice:** produced by fermenting various fruit or vegetable juices, contain organic acids such as acetic and lactic acid that inhibit mold growth by lowering the pH. These juices can be used at levels ranging from 1% to 3% in baked goods, with specific usage levels based on the type of raisin juice and its acid content.<sup>9,10</sup>
- **Rowanberry extract** contains bioactive compounds and organic acids, including sorbic acid, which have antimicrobial properties to inhibit the growth of spoilage bacteria, yeast, and mold in tortillas.<sup>9,10</sup>



# TORTILLA PROCESSING



Tortillas can be made by the following general process:

1. **Scaling/Metering of Ingredients:** measuring and weighing flour, water, salt, fat, and other ingredients. Precision in ingredient measurement is an essential step.
2. **Mixing:** they are combined in a mixer and mixed till the dough is fully developed. The mixing process ensures that all ingredients are evenly distributed and thoroughly incorporated, resulting in a cohesive dough. Inadequate mixing to full development will result in tortillas that crack easily when rolled.
3. **Dividing and Rounding:** dough is divided into individual portions of uniform size. This step is crucial for the hot press, ensuring consistency in the size and shape of the tortillas. The divided portions of dough are then rounded into smooth, evenly-shaped balls, ready for further processing.
4. **Rest:** rest is given to the dough for a few minutes so that it can be easily sheeted or hot-pressed.
5. **Sheeting/Stretching or Hot-Pressing:** the dough is sheeted between rollers to form a continuous thin sheet of dough before it is die-cut. Alternatively, for a hot press process, the rounded dough balls are placed between heated plates and pressed. This process creates the characteristic round shape of tortillas and ensures even thickness throughout.
6. **Cooking:** cut tortillas are then baked on a hot surface, such as a griddle or conveyor oven, until they are fully cooked and develop golden brown spots on the surface. Baking imparts flavor and texture to the tortillas while ensuring that they are thoroughly cooked and safe to consume.
7. **Cooling:** hot tortillas are transferred to a cooling conveyor or rack to allow them to cool to room temperature. Proper cooling prevents moisture from condensing in the package and prevents the tortillas from sticking to each other.
8. **Packaging:** stacked tortillas are packaged into bags, boxes, or other containers, ready for distribution. Packaging helps to protect the tortillas from moisture, air, mold spores, and physical damage.



**Improve  
Quality and  
Consistency  
with Vision  
Inspection**



**Click Here!**

***Oat Fiber from Grain Millers Offers Multi-Functional Benefits and Clean Label Opportunity. Want to learn more!***

# Hot-press

1

**Pros:** hot-press flour tortillas are smoother in surface texture, more elastic, slightly chewy, and resistant to tearing and cracking. Hot-press tortillas account for more than 90% of the retail market.<sup>2,3</sup>

**Cons:** requires a more relaxed dough, and thus may need more dough conditioners.<sup>2,3</sup>



ALL THE INGREDIENTS YOU NEED  
*to Make Good Happen*

Boost nutrition and functionality  
while reducing formulation cost.

[LEARN MORE ABOUT OUR OAT FIBER >](#)

GRAIN MILLERS

# Die-cut

2

**Pros:** tortilla dough is extruded to 0.5 – 2.5 mm and cut into individual round pieces. The die-cut method greatly reduces the cost of producing tortillas due to its high throughput.<sup>2,3</sup>

**Cons:** wraps may shrink if the dough is too elastic. The cutter may be designed to be slightly oblong to compensate for shrinkage after cutting. However, this method produces excess scrap dough that needs to be utilized efficiently or discarded. Excess waste may be produced if water absorption is not optimized for flour quality. This requires trained and skilled labor at the mixer/sheeting operator positions.<sup>2,3</sup>



# TORTILLA FORMULATION

## Wheat Flour Tortilla (Chemically Leavened)

Ingredient	Wheat Flour Tortilla (Baker's %)
Wheat flour	100.0
All-purpose shortening	6.0
Salt	1.5
Sodium stearoyl lactylate	0.5
Potassium sorbate	0.4
Sodium bicarbonate	0.6
Fumaric acid	0.24
Sodium aluminum sulfate	0.58
L-Cysteine	0.003

Table 1: Wheat Flour Tortilla (Chemically Leavened) formulation



Use Mixolab 2 to Unlock Dough  
Quality Secrets for Perfect Tortillas



[Click Here!](#)

# Wheat Flour Tortilla (Yeast raised)

Ingredient	Wheat Flour Tortilla (Baker's %)
Hard/soft wheat flour blend*	100%
Water	45 - 60%
Salt	1.5-2.5
Shortening	2.0-10.0
Yeast (compressed)**	0.1-1.0
Nonfat dry milk	0.3-2.0
Soy flour (defatted)	1.0-5.0
Vital wheat gluten (VWG)	1.0-5.0
Gums	0.25
Reducing agents (Reducing agents (L-cysteine), proteases, emulsifiers (SSL, CSL, DATEM))	Varies
Calcium propionate	0.2

Table 2: Wheat Flour Tortilla (Yeast Leavened) formulation

\* All-purpose flour can be used.

\*\* Baking powder can be used instead of yeast (1.5–2.0% based on flour weight).

\*\*\* Different types and levels can be used, depending on the dough handling properties desired, machinability (rollability), and target flavor and shelf-life.



Explore insights and solutions for tortilla formulation success



[Download solutions guide](#)

# Gluten-free Tortilla

Ingredient	Gluten-free Tortilla (Baker's %)
Rice flour	55.00
Gluten-free flour (corn or Oat flours)	20.00
Rice starch (Pregelatinised modified rice starch 70% < 125 um)	20.00
Shortening	20.00
Benexia xia powder 435W LM	11.00
Rice starch	10.00
Inulin	8.00
Salt	1.50
Yeast extract	1.00
Water at 25°C or (77°F)	80.00

Table 3: Gluten-free tortilla formulation with GF Benexia Xia Powder 435W LM



# Corn Tortilla

Ingredient	Corn Flour Tortilla (Baker's %)
Corn meal (size-graded)*	100.0
Water	25.0-35.0
Soy flour (defatted)	1.0-10.0
Gums (CMC, pre-gel starch)	0.5-2.0%
Calcium hydroxide**	0.1-1.0%
Mold inhibitors	0.05-0.3%
Emulsifiers (lecithin, monoglycerides, SSL)	Varies
Acidulant	Varies due to pH
Vitamins and minerals (pre-mixes)	Varies

Table 4: Corn tortilla formulation

\* US 40-mesh sieve (screen size 0.016 in).

\*\* Lime must be suitable for use in food and comply with local food legislation.



**Ensure  
Dough  
Quality  
Tailored to  
Your Needs**

**Click Here!**

# QUALITY OF TORTILLAS

Achieving acceptable and consistent quality necessitates anticipating the dough's behavior during production. This anticipation is achieved through a comprehensive understanding of the recipe's ingredients and the specific manufacturing process. Utilizing a set of instrumentation equipment to study quality parameters provides the necessary information for this understanding.

## Tortilla Quality Parameters

Parameter	Cause/Effect	Ideal Value	Instrumental measurement
<b>pH</b>	Shelf-life of the product. Higher pH tortillas tend to have a better flavor, aroma, and appearance but may compromise shelf-life.	Wheat flour: 5.2 - 6.2 Corn flour: 4.8 - 5.2	<ul style="list-style-type: none"> <li>• Electrode pHmeter</li> </ul>
<b>Water absorption</b>	Influences dough properties: consistency, extensibility and elasticity Influences shelf-life of the product	Wheat Flour: 59-63%*	<ul style="list-style-type: none"> <li>• Consistency: MIXOLAB 2</li> <li>• Extensibility and elasticity: Alveograph</li> </ul>
<b>Damaged starch</b>	Influences dough properties: consistency and stickiness Influences shelf-life of the product	UCD <19**	<ul style="list-style-type: none"> <li>• SDmatic 2</li> </ul>
<b>Stickiness</b>	Water is not properly absorbed due to high levels of damaged starch and pentosans, and low levels of protein.	Damaged starch: UCD <19** Wheat Flour Protein: 7.0-10.8%	<ul style="list-style-type: none"> <li>• SDmatic 2</li> <li>• Protein: NIR</li> </ul>

Table 6: Tortilla Quality Parameters and Measurement

\*Rooney, Lloyd W., and Sergio O. Serna-Saldivar. *Tortillas: wheat flour and corn products*. Elsevier, 2015.

\*\*Values obtained from M. Hikmet Boyacioglu, Narasa Reddy Sunkara, Lei Zhong, and Elisa Karkle. *Impact of flour type and damaged starch content on tortilla quality parameter*. KPM Analytics. 2023. UCD is the international unit of damaged starch

Parameter	Cause/Effect	Ideal Value	Instrumental measurement
<b>Rollability</b>	Subjective measurement that influences overall acceptability	5	The tortilla is rolled around a dowel by a trained evaluator.  Subjective scale: 5 = rolls around a 1-cm dowel with no signs of cracking, 4 = slight signs of cracking, 3 = cracking and breaking beginning on the surface, 2 = cracking and breaking imminent on both sides, and 1 = unrollabable, breaks easily.
<b>Foldability/Flexibility</b>	<ul style="list-style-type: none"> <li>• Subjective measurement that influences overall acceptability.</li> <li>• Objective measurement of flexibility by taking into account the quality of the protein network, amylase performance, and damaged starch level</li> </ul>	<ul style="list-style-type: none"> <li>• 0% flexibility score (ideal), 100% (all cracks)</li> <li>• Varies</li> </ul>	<ul style="list-style-type: none"> <li>• Percent Flexibility Score for Wheat Flour Tortillas</li> <li>• Protein network: Alveograph</li> <li>• Amylase activity: Mixolab 2</li> <li>• Damaged starch: SDmatic 2</li> </ul>

Table 6: Tortilla Quality Parameters and Measurement (Continuation)

\*Rooney, Lloyd W., and Sergio O. Serna-Saldivar. *Tortillas: wheat flour and corn products*. Elsevier, 2015.

\*\*Values obtained from M. Hikmet Boyacioglu, Narasa Reddy Sunkara, Lei Zhong, and Elisa Karkle. *Impact of flour type and damaged starch content on tortilla quality parameter*. KPM Analytics. 2023. UCD is the international unit of damaged starch

## How Flexible is your Tortilla?



**Try this test!** This test consists of folding in half the tortilla three times until it reaches the shape of a slice of pie. Then, the folded tortilla is flattened. Afterward, the tortillas are unfolded, and the number of lines that show cracking on each side is counted. The flexibility score is obtained by dividing the number of lines counted by 16 and multiplying by 100. A perfect score is 0% which means it doesn't show any cracks, and a non-flexible tortilla with all the cracks possible has a score of 100%.



## Reveal the Hidden Potential: Dough Quality and Vision Technology for Baking Perfection

Maximize production efficiency, reduce waste, and ensure a high-quality product at each step of the process with state-of-the-art technologies.

- **Mixolab 2:** Assess the quality and performance of raw materials and doughs to gain deeper insights into their behavior during production.



- **Q-Bake Vision Inspection Systems:** Real-time vision systems inspect 100% of products, guaranteeing compliance with user-defined specifications.



[Click Here to Learn More](#)

[WWW.KPMANALYTICS.COM](http://WWW.KPMANALYTICS.COM)

# Novel Quality Analysis Technologies

Tortilla and flatbread manufacturing processes are inherently more time-efficient compared to traditional bread production, primarily due to the absence of an extended proofing stage. This enables manufacturers to achieve high-volume output in significantly less time. To maintain stringent quality standards across all products, the implementation of advanced in-line vision inspection systems is essential.<sup>13</sup>

These systems continuously monitor critical quality parameters, such as the diameter, uniformity of shape, and the presence and consistency of toast marks. By leveraging cutting-edge imaging technology, manufacturers can ensure that each piece meets precise specifications, thereby enhancing product consistency and customer satisfaction.<sup>13</sup>

*In modern tortilla production, advanced vision inspection systems play a crucial role in ensuring product quality and consistency. These systems use high-resolution cameras and sophisticated image-processing software to detect defects, measure product dimensions, and ensure uniformity in shape, size, and color. By scanning each tortilla or wrap as it moves along the production line, vision inspection systems can identify imperfections such as uneven baking or surface blemishes. This real-time quality control allows for immediate corrective actions, reducing waste and improving overall efficiency. Additionally, data collected from vision inspection systems can be analyzed to identify trends and areas for process improvement.*<sup>13</sup>



**Inspect the tortillas' shape, color, and more at full line speed**

**Click Here!**

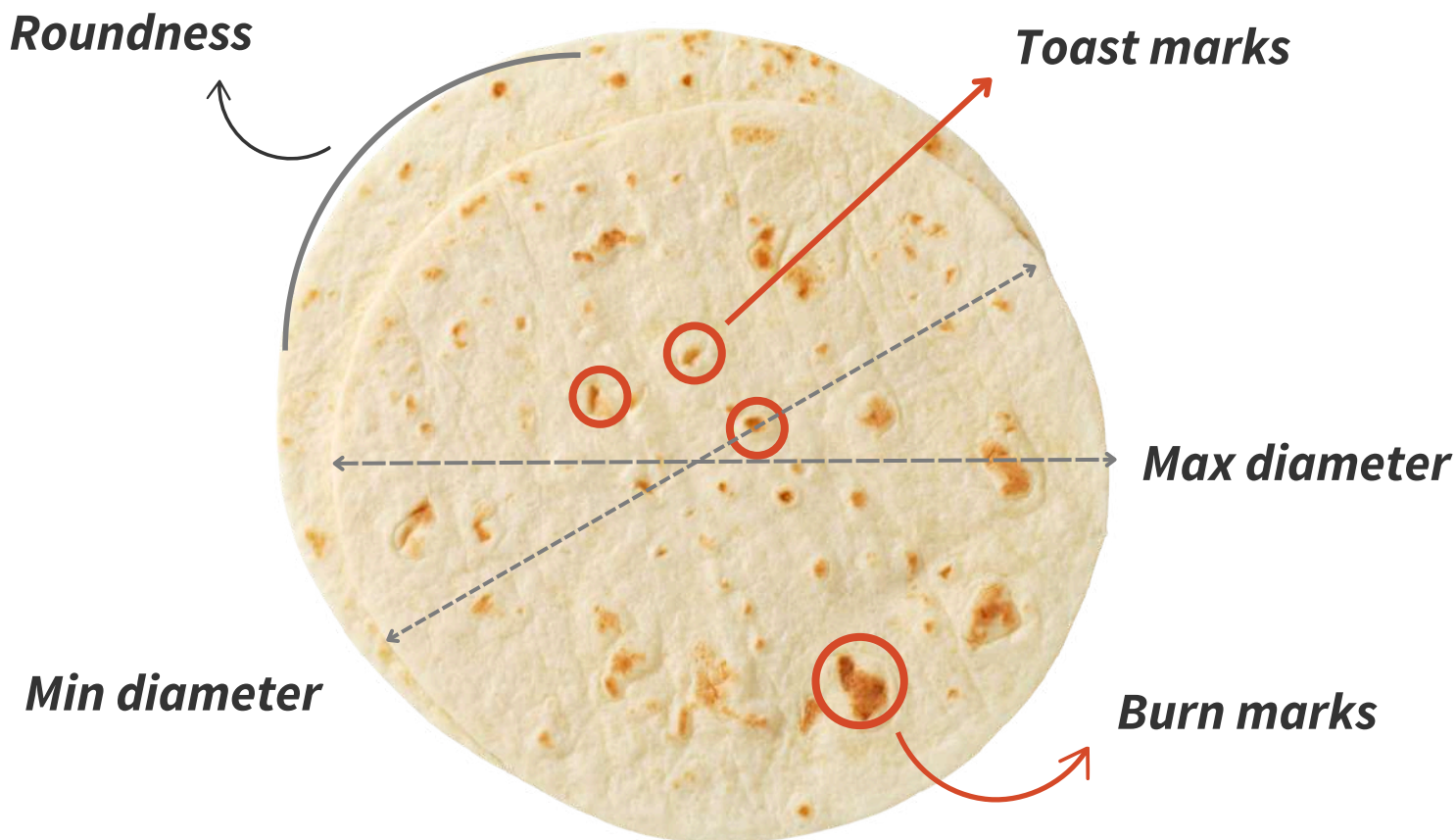




# Vision Systems Measurement and Defects Determination Capacity

Measurement Capability	Defects Detected
Diameter, roundness, area, length, width	Misshapen product. Out of Spec - e.g. too small, too big
Peak/mean height, slope, surface texture, stack height	Edge Defects - e.g. bites, dents, straight edges
Bake Color	Spots - topping color, coverage, distribution, voids
Toast Marks - Color, coverage, distribution, voids	Toast Mark Defects - too few, voids, etc

Table 7: Vision System Measurement Capabilities and Defects



**Discover how KPM Analytics' vision inspection systems help bakers maintain high standards and meet customer expectations consistently. [Learn more!](#)**

# TROUBLESHOOTING TORTILLAS



*How can I improve the softness of my tortillas?*

Using wheat protein isolate rich in gliadin increases the shelf life and softness of the tortillas. A standard tortilla usually has a specific volume of 1.4 cm<sup>3</sup>/g. Some studies show that using a 3% g wheat protein isolate can increase its specific volume to 1.60 cm<sup>3</sup>/g, making the tortilla softer.

A good quality tortilla should have a 14-day shelf life when measured with the 5-point rollability score method as mentioned above. The addition of gliadin-like proteins to tortilla flour increases the shelf life significantly.

The addition of up to 2% oil or shortening and emulsifiers like mono and diglycerides would help the rollability of tortillas. Lastly, the use of shelf-life extension enzymes like amylase would reduce starch retrogradation and improve the softness of the tortilla.



*Our tortillas are great when fresh, but after a day, they crack when stretched. How can we improve its quality?*

Start by using flours (milled from hard red winter wheat) developed for bread with moderate protein quality and dough strength. In addition, the use of 2% shortening may give you a softer tortilla with an increased shelf life. Depending on the makeup of the shortening used, this product may not exhibit cracking for over 20 days. Don't forget to use emulsifiers, and enzymes to help with the flexibility of the product and to inhibit starch retrogradation.





*How do we prevent our tortillas from sticking to each other and tearing when our customers take them out of the package?*

There are a few reasons why tortillas stick to each other after they are packaged and delivered. The biggest cause of this is inadequate cooling. If tortillas are not cooled to around 25°C (77°F), condensation may still occur in the package, and this enhances the adhesiveness of the individual tortillas. If you are dependent on conveyor cooling, use air jets to deliver cool air, or slow down your conveyor lines. Another way to cool down your tortilla cooling line is to make sure that the relative humidity and temperature of your plant are as low as you can make it. Last but not least, baking it longer would drive out more moisture. Since water is an insulator, less water in the final tortilla would make it cool faster.





Ingredion<sup>®</sup>

Be what's next™



## Create delicious tortillas with more protein and fewer carbs

**Tortillas now represent a \$10 billion market in the U.S.<sup>1</sup>** Consumers crave food with healthful benefits, and tortillas are no exception. How can brands succeed in the growing tortilla market? Download our tortilla solutions guide to discover the proven ingredients, key insights and formulation expertise needed to add value and create your next market-winning product.

Explore solutions for tortilla formulation success:

[go.ingredion.com/na/en-us/tortilla-solutions](https://go.ingredion.com/na/en-us/tortilla-solutions) | 1-800-713-0208

Source: 1. Future Market Insights, Tortilla Market by Product Sales Analysis & Opportunity, 2022

The INGREDION mark and logo are trademarks of the Ingredion group of companies. All rights reserved. All contents copyright © 2024.

# SUMMARY

Tortillas are here to stay, and keeping up with the latest production trends is a must-have for bakers worldwide. From the basic to the most state-of-the-art quality control techniques this guide will give you a trip through the wonderful world of tortilla production.

If you need additional technical support in tortilla formulation or an improvement of your novel tortilla production efficiencies, contact us.

# REFERENCES

1. Market Research Future, <https://www.marketresearchfuture.com/>. Tortilla Market Size, Share, Industry Analysis, Report, 2032, [www.marketresearchfuture.com/reports/tortilla-market-2419](http://www.marketresearchfuture.com/reports/tortilla-market-2419). Accessed 21 Apr. 2024.
2. Edwards, William P. The science of bakery products. Royal Society of chemistry, 2007.
3. Rooney, Lloyd W., and Sergio O. Serna-Saldivar. Tortillas: wheat flour and corn products. Elsevier, 2015.
4. Chaidez-Laguna, LD, et al. "Impact of L-Cysteine Addition on Nixtamalized Corn Dough: Proteins and Viscoelasticity." Biotecnia, Universidad de Sonora, [www.scielo.org.mx/scielo.php?pid=S1665-14562022000100151&script=sci\\_arttext](http://www.scielo.org.mx/scielo.php?pid=S1665-14562022000100151&script=sci_arttext). Accessed 27 July 2024.
5. Garcia, Marcelo Valle, Angélica Olivier Bernardi, and Marina Venturini Copetti. "The fungal problem in bread production: Insights of causes, consequences, and control methods." *Current Opinion in Food Science* 29 (2019): 1-6.
6. D. Austin et al. "Enzymes: Extending Shelf Life and Eating Quality of Tortillas." (2015): 201-214. <https://doi.org/10.1016/B978-1-891127-88-5.50010-4>.
7. Nilsson, Fredrik. "Accelerated shelf life tests of wheat tortillas A study of microbial and textural deterioration in wheat tortilla." (2018).
8. Barros, F., J. N. Alviola, and L. W. Rooney. "Comparison of quality of refined and whole wheat tortillas." *Journal of Cereal Science* 51.1 (2010): 50-56.
9. Saranraj, P., and M. Geetha. "Microbial spoilage of bakery products and its control by preservatives." *International Journal of Pharmaceutical & biological archives* 3.1 (2012): 38-48.
10. Perez-Gonzalez, A, Emami, M. Fumaric Acid: The Acid of Choice for Bakery. Bartek Whitepaper. (2020).
11. "Tortillas: Commercial Baking Specialties." BAKERpedia, 26 Feb. 2024, [bakerpedia.com/specialties/tortillas/](http://bakerpedia.com/specialties/tortillas/). Accessed 21 Apr. 2024.
12. "Corn Tortillas: Baking Processes." BAKERpedia, 21 Feb. 2024, [bakerpedia.com/processes/corn-tortillas/#:~:text=Corn%20tortillas%20are%20a%20round,in%20a%20process%20called%20nixtamalization](http://bakerpedia.com/processes/corn-tortillas/#:~:text=Corn%20tortillas%20are%20a%20round,in%20a%20process%20called%20nixtamalization). Accessed 21 Apr. 2024.
13. "Analysis of Tortilla & Flatbreads." KPM Analytics, <https://www.kpmanalytics.com/sub-segments/tortilla-flatbread>. Accessed 01 Aug. 2024.
14. M. Hikmet Boyacioglu, Narasa Reddy Sunkara, Lei Zhong, and Elisa Karkle. Impact of flour type and damaged starch content on tortilla quality parameter. KPM Analytics. 2023.

# BROUGHT TO YOU BY

---

## VANTAGE FOODS



*Vantage Food's Satin Liquid Shortening Blend allows you to create smoother, softer tortillas and wraps with enhanced product shelf-life. It provides a superior texture while ensuring your products stay fresh and enjoyable for longer. [Learn more here!](#)*

## GRAIN MILLERS



*Oat fiber from Grain Millers is a cost-effective, clean, low-calorie ingredient that boosts dietary fiber content in a natural way. [Learn more!](#)*

## INGREDION



*Consumers are increasingly selecting tortilla options with clean labels and better-for-you benefits like more protein and fewer carbs. The category is growing, but to succeed, brands must find innovative solutions that drive consumer preference. Partner with Ingredion to create what's next — [download our tortilla solutions guide](#) to review key insights, explore featured ingredients and see how we add value for consumers and your brand.*

# BROUGHT TO YOU BY

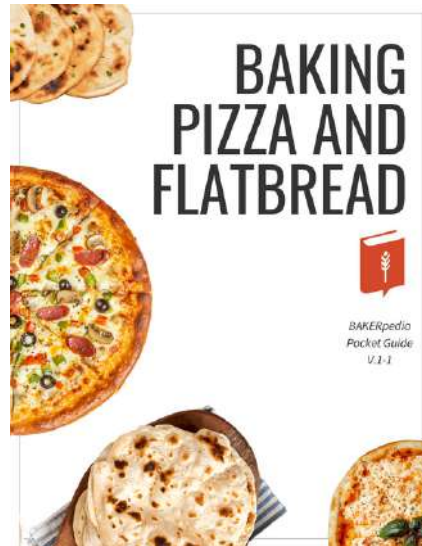
---

## KPM ANALYTICS



*KPM Analytics provides instruments that measure critical quality parameters throughout the production process, from ingredient assessment to product analysis during baking, and ensuring final product quality. Their analyzers help food producers improve efficiency, ensure quality, and protect your brand. Learn how their Vision Inspection Solution and Flour & Dough Analyzers can enhance your tortillas or wraps production. [Learn more!](#)*

# Check Out More Pocket Guides!



## About BAKERpedia

BAKERpedia is here to educate, inspire and empower the professional baking & food industry with cutting-edge science solutions. Based in Portland, Oregon, USA, BAKERpedia has team members and collaborators around the world. From technical writers to bakery experts, we are thinking of new ways and mediums to share information with you. We're proud to partner with many of the leading and innovative players in the baking industry.

Copyright © 2024 BAKERpedia. All rights reserved.

No part of this guide may be reproduced without permission. For permissions, contact the publisher at 5200 SW. Meadows, Suite #200, Lake Oswego, OR 97034, U.S.A.

Disclaimer: This guide is for informational purposes only. The publisher is not liable for any errors or omissions. Readers should consult professionals for specific advice.