



# Shortening Selection

 **BUNGE**

# The Foundation of a Great Tortilla

## What is Shortening?

- In tortillas, "shortening" refers to any fat used to tenderize the dough, literally "shortening" the gluten strands to prevent toughness.
- It encompasses a range of fats, from solid to liquid, each contributing unique properties.

## Why is Shortening Critical?

- **Texture and Pliability**
- **Flavor and Aroma**
- **Shelf Life**
- **Processing Aid**



# Why Are Shortenings Critical?

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## **Texture and Pliability:**

Fats contribute to a soft, tender, flexible, and rollable tortilla, preventing it from becoming stiff or crumbling.

Solid fats can also help prevent tortillas from sticking together.

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## **Flavor and Aroma:**

Fats can impart desirable flavors, such as the pork flavor from lard, or a clean profile that allows other ingredients to shine.

Good mouthfeel (not waxy or oily)



# Why Are Shortenings Critical?

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## Shelf life:

Contribute to extended freshness throughout shelf-life. Shortening provides better oxidative stability compared to animal fats.

Addition of emulsifiers provide anti-staling benefits.

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## Processing aid:

Enhance dough machinability, making it easier to mix, sheet, and press. They improve dough machinability by lubricating the matrix and coating wheat proteins (gluten). Without sufficient lubrication, dough would be tacky and difficult to work with.

- Bunge NH 333 Tortilla Shortening
  - Palm Oil with Mono & Diglycerides
- Bunge Vream Classic Tortilla Shortening 337
  - Interesterified Soybean Oil with Mono & Diglycerides

# Key Factors for Shortening Selection

## Desired Tortilla Characteristics:

- **Texture:** Soft, pliable, chewy, flaky, tender? (e.g., vegetable shortening pliable and tender, liquid oil for extreme softness).
- **Flavor Profile:** Neutral, rich, savory, buttery? (e.g., hydrogenated veg. for neutral, lard/butter for distinct flavor).
- **Shelf-Life Expectations:** How long must the tortillas remain fresh and pliable? (e.g., hydrogenated fats offer good stability).



# Key Factors for Shortening Selection

## Cost & Budget:

- Raw material cost differences can significantly impact your bottom line.
- Consider the trade-off between ingredient cost and perceived product value/quality.

## Health & Nutritional Considerations:

- **Saturated Fat:** Consumer awareness and dietary guidelines are shifting.
- **Trans Fat:** Largely eliminated from commercial shortenings due to health concerns and regulations.
- **Allergen Concerns:** Dairy (butter) is a common allergen.
- **Consumer Perceptions:** "All-natural," "no hydrogenated oils," "plant-based," "sustainable."

# Key Factors for Shortening Selection

## Processing & Handling:

- **Ease of Incorporation:** Solid fats require creaming; liquid oils are easier to blend.
- **Smooth Plastic Texture:**
  - Must have good SFC content and moderate melting point
  - Too much liquid oil makes a sticky dough and leads to excessive translucency in the finished product.
- **Good mixing characteristics:**
  - Must cream in with dry ingredients to coat flour and other ingredients properly
  - Must not leave lumps of shortening in the dough, can cause holes in the finished tortilla
- **Impact on Dough Rheology:** How does the fat interact with gluten development and dough handling?
- **Storage Requirements:** Refrigeration vs. shelf-stable. Need good tolerance for a wide range of temperatures.

# Key Factors for Shortening Selection

## Regulatory & Marketing:

- **Labeling Requirements:** Clear declaration of ingredients, nutritional panels.
- **Market Positioning:** Are you targeting premium, health-conscious, traditional, or budget segments?
- **Vegan/Vegetarian Suitability:** Essential for specific market segments.

## Availability & Supply Chain:

- Reliability and consistency of sourcing your chosen shortening.
- Ethical sourcing considerations (e.g., sustainable palm oil).

# Strategies for Shortenings

- A certain level of Saturates is required
  - Give proper texture to the dough
  - Mouthfeel- eating quality
  - Dough processing
- Saturates can come from:
  - Natural Saturates
    - Palm, Palm Fractions, PKO
  - Fully Hydrogenated Saturates (Interesterified)
    - Full Hydro Soy or Cottonseed



# Shortening Requirements for High-Speed Processing Lines

- **Typically contain a small dose of emulsifier**
  - Helps with dough processing
    - Makes doughs less sticky on rollers and belts
  - Improves packaged product stability
    - Extends shelf life by preventing some starch retrogradation and therefore keeps the dough soft
    - Prevents the individual tortillas in a stacked package from sticking together (**known as welding**).
    - Soy products are more tolerant of freeze/thaw cycle





## Why Emulsifiers?

### **For tortilla manufacturing, emulsifiers are indispensable.**

- Act as Dough Conditioners: improve softness and extensibility, prevent staling, and enhance the overall quality and efficiency of production.
- Provide Uniform Distribution of Ingredients: leading to a more consistent and appealing final product.
- Increase Moisture Holding Capacity: The shortening promotes flour hydration, increases process efficiency, and results in less wear and tear on production equipment. It helps to produce firm and extensible tortillas with larger diameter without impacting yield and profitability.
- Improves Rollability: Producing tortillas with enhanced appearance and functionality over their shelf-life.

# Common Emulsifiers



- **Monoglycerides and Diglycerides (MDG):** These are widely used due to their ability to prevent oil and water separation, stabilize emulsions, and improve texture and shelf life. They are effective at reducing stickiness and improving the flexibility of tortillas.
  - Used in low quantities as emulsifiers and stabilizers.
- **Lecithin:** A natural emulsifier, lecithin (often soy or sunflower-derived) improves processing efficiency by aiding mixing and promoting flour hydration. It functions as a dough conditioner, enhancing gluten formation, dough extensibility, and reducing stickiness. Lecithin also contributes to shelf-life stability and appearance.
  - Low levels, typically 0.5-1.0% based on flour weight, can achieve significant benefits.

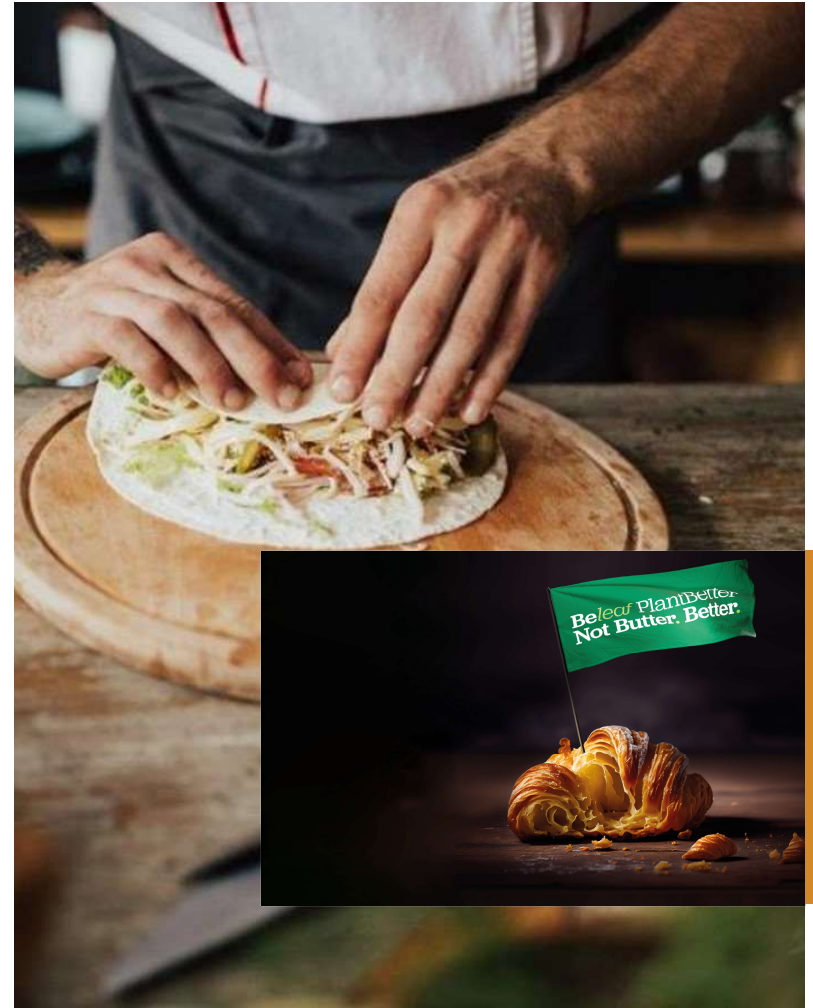
# Understanding Shortening Types

## Traditional Fats:

- **Lard:** Rendered pork fat, a classic for authentic flavor.
- **Hydrogenated Vegetable Shortening:** Industrially produced from vegetable oils, known for consistency.

## Modern & Alternative Fats:

- **Non-Hydrogenated Vegetable Shortening:** Often palm-based or blends, designed to be trans-fat free.
- **Liquid Oils:** Such as canola, sunflower, or corn oil, offering health benefits and ease of use.
- **Butter:** A less common, premium option for distinct flavor.
- **Non-Dairy Plant Butter Alternative:** Beleaf PlantBetter



# Deep Dive: Traditional Shortenings

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- **Lard (Rendered Pork Fat)**

- **Source/Composition:** Derived from pork fat, primarily saturated and monounsaturated fats.
- **Impact on Tortillas:** Delivers superior pliability, a distinct savory flavor, and a uniquely tender yet flaky texture.
- **Pros:**
  - Authentic, rich flavor (especially for savory applications).
  - Excellent texture: soft, pliable, and often with a desirable "stretch."
  - Traditional choice for many Mexican and Central American recipes.
- **Cons:**
  - High in saturated fat.
  - Not suitable for vegetarian or vegan diets.
  - Requires refrigeration and has a shorter shelf life than vegetable shortenings if not rendered properly.
  - Can be inconsistent in quality depending on rendering.

# Deep Dive: Traditional Shortenings

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- **Hydrogenated Vegetable Shortening**

- **Source/Composition:** Made by chemically altering liquid vegetable oils (e.g., soybean, cottonseed) to become solid at room temperature.
- **Impact on Tortillas:** Imparts good tenderness, pliability, and contributes to a longer shelf life due to its stability.
- **Pros:**
  - Cost-effective and widely available.
  - Very long shelf life and consistent performance.
  - Neutral flavor, allowing other ingredients to shine.
  - Vegan/vegetarian friendly.
  - Excellent creaming properties for dough work.
- **Cons:**
  - Historically associated with trans fats (partially hydrogenated no longer permitted). Fully hydrogenated options exist but are still high in saturated fat.
  - Negative consumer perception due to "hydrogenated" label.

# Deep Dive: Modern & Alternative Shortenings

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- **Non-Hydrogenated Vegetable Shortening (e.g., Palm Oil, Blends)**
  - **Source/Composition:** Typically derived from palm oil or blends of other non-hydrogenated vegetable oils (e.g., soy, sunflower) that are naturally solid or semi-solid.
  - **Impact on Tortillas:** Offers good texture, pliability, and a neutral flavor profile without trans fats.
  - **Pros:**
    - No trans fats (a major health advantage).
    - Vegan/vegetarian friendly.
    - Improved health profile compared to partially hydrogenated options.
    - Neutral flavor.
  - **Cons:**
    - Often high in saturated fat (especially palm oil).
    - Palm oil has significant environmental (deforestation) and ethical sustainability concerns.
    - Can sometimes be less consistent in texture/performance than fully hydrogenated fats.

# Deep Dive: Modern & Alternative Shortenings

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- **Liquid Oils (e.g., Canola, Sunflower, Corn Oil)**
  - **Source/Composition:** Various liquid vegetable oils, primarily unsaturated fats.
  - **Impact on Tortillas:** Produces a very soft, flexible tortilla, but typically less flaky than those made with solid fats. Can sometimes feel "oilier."
  - **Pros:**
    - Healthier fat profile: lower in saturated fat, higher in monounsaturated/polyunsaturated fats.
    - Vegan/vegetarian friendly.
    - Easy to incorporate into doughs.
    - Neutral flavor.
  - **Cons:**
    - Can result in a less traditional texture; tortillas may be less elastic or "chewy."
    - Higher risk of oxidative rancidity, potentially leading to shorter shelf life or off-flavors if not formulated correctly.
    - May require formula adjustments (e.g., hydration levels) due to different fat interaction with gluten.

# Deep Dive: Modern & Alternative Shortenings

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- **Butter (Less Common)**

- **Source/Composition:** Dairy fat from churned cream, composed of butterfat, water, and milk solids.
- **Impact on Tortillas:** Imparts a rich, unique flavor and a tender crumb.
- **Pros:**
  - Exceptional, rich, and appealing flavor.
  - "Clean label" appeal for some consumers.
- **Cons:**
  - High cost, significantly impacting product pricing.
  - Dairy allergen, not suitable for vegan/dairy-free consumers.
  - High in saturated fat.
  - Less shelf-stable than other shortenings; prone to rancidity.
  - Can lead to brittle or crumbly tortillas if not used judiciously and balanced with other ingredients.

# Deep Dive: Modern & Alternative Shortenings

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- **Non-Dairy Butter Alternative (Less Common)**

- **Source/Composition:** Tropical Fats, Oilseed Oil, Plant Milk, Water, Lecithin, Natural Flavors and Colors
- **Impact on Tortillas:** Imparts a rich, unique flavor and a tender crumb.
- **Pros:**
  - Exceptional, rich, and appealing flavor.
  - Equal Sensory Preference vs Butter
  - "Clean label" appeal for some consumers.
  - Lower Price Point than butter
- **Cons:**
  - Higher cost than traditional shortenings, impacting product pricing.
  - Potentially higher in saturated fats than vegetable shortenings, but lower than butter.



# Decision Matrix & Recommendation Framework

**Prioritize Your Goals:** What is your #1 driver for tortilla quality?

- **Authentic Flavor & Superior Pliability:** Lard is often the top choice.
- **Cost-Effectiveness & Consistency (Neutral Flavor):** Hydrogenated or Non-Hydrogenated Vegetable Shortening.
- **Health Profile (Low Saturated Fat) & Softness:** Liquid Oils (with formula adjustments).
- **Premium Flavor & Richness (Dairy & Non-Dairy):** Butter (at a higher cost and for specific applications).



**Consider Trade-offs:**

- **Cost vs. Quality:** Premium ingredients often mean higher costs but can command higher prices. Shelf-life considerations.
- **Health vs. Traditional Texture:** "Healthier" fats might alter traditional texture profiles.
- **Sustainability vs. Performance:** Palm oil offers functional benefits but carries environmental concerns.

# Conclusion & Best Practices

## No Single "Best" Shortening:

- The ideal choice is highly dependent on your specific product vision, target market, operational capabilities, and ingredient philosophy.

## Embrace Experimentation:

- Always conduct small-batch trials with different shortenings.
- Evaluate sensory attributes (texture, flavor, pliability) and shelf life.
- Observe processing performance and dough handling.

## Balance & Optimize:

- Strive for a balance between consumer expectations, ingredient costs, nutritional goals, and functional performance.
- Consider blends of shortenings to achieve desired attributes (e.g., a small amount of lard for flavor with a larger portion of vegetable shortening for stability).

## Stay Informed:

- Keep abreast of ingredient innovations, consumer trends, and regulatory changes in the fats and oils market.

# Customer-Driven Innovation

**Our expertise, culture of innovation, unparalleled portfolio of products and tech-forward solutions give us a competitive advantage to tackle the industry's most pressing challenges.**

~20 innovation centers across the Americas, Europe, India and Asia

200+ R&D and technical support experts

300+ patents awarded for innovations developed by our R&D specialists

- We provide ingredients and know-how to some of the world's most recognized companies
- We collaborate with customers through our global, agile team of food scientists and researchers
- We have a broad and scaled product set
- We cultivate cost-efficient, sustainable ways of bringing high-quality, safe foods and products to market



A photograph of a kitchen scene, overlaid with a semi-transparent blue filter. A hand is pouring water from a clear plastic bottle into a dark pot on a stove. To the left, a plate of food, including what looks like a fried egg and some vegetables, sits on the counter. The text "Let's create together" is written in a white, cursive font across the center of the image.

*Let's create together*