Clean Label for Tortillas

Who is AIB International?

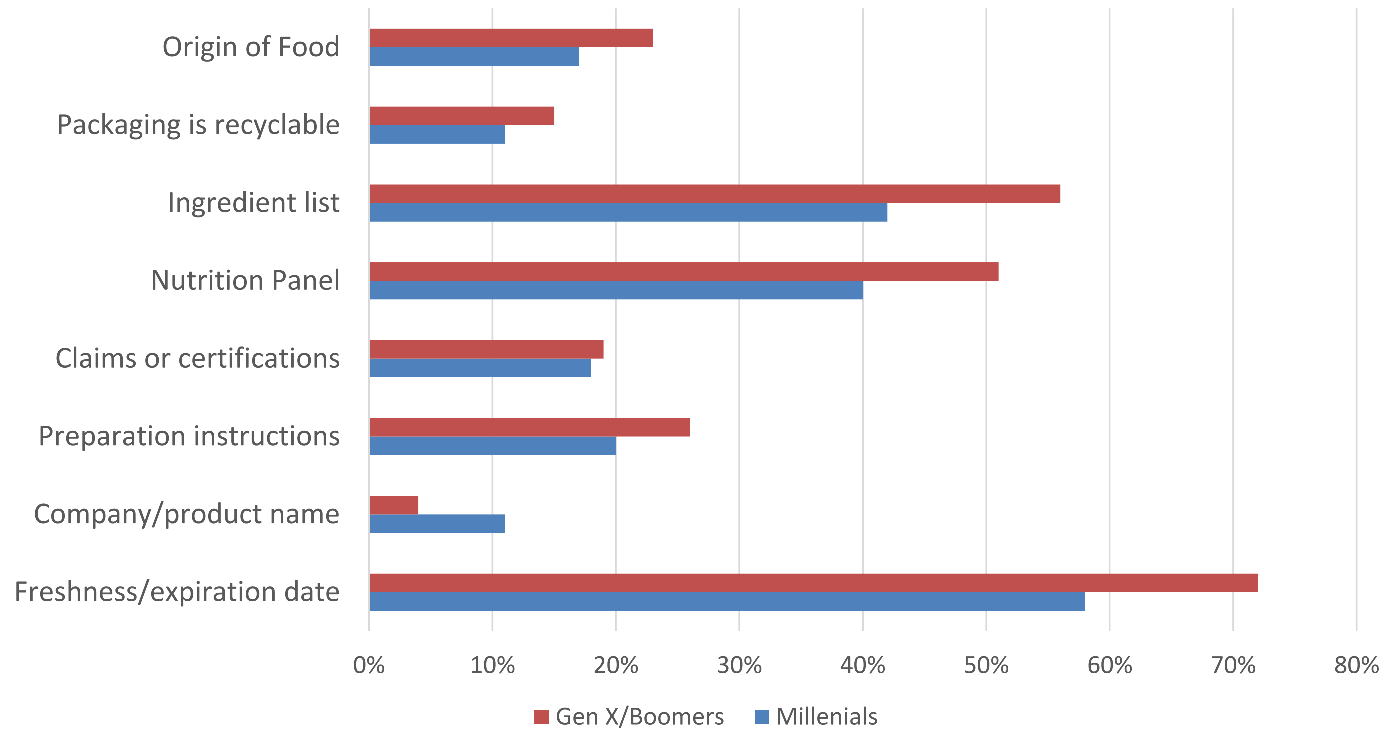
- For 100 years, AIB International has been committed to partnering with our clients to ensure the enjoyment of safe, high-quality food everywhere.
- Our global team of food safety and quality professionals in 120 countries helps our customers address virtually every link in their supply chains.
- We believe everyone deserves safe, high-quality food, so we are proud to celebrate our 100th anniversary here at IBIE by continuing to share our insights and expertise with the industry.

Clean label has different meanings and implications for:

Consumers

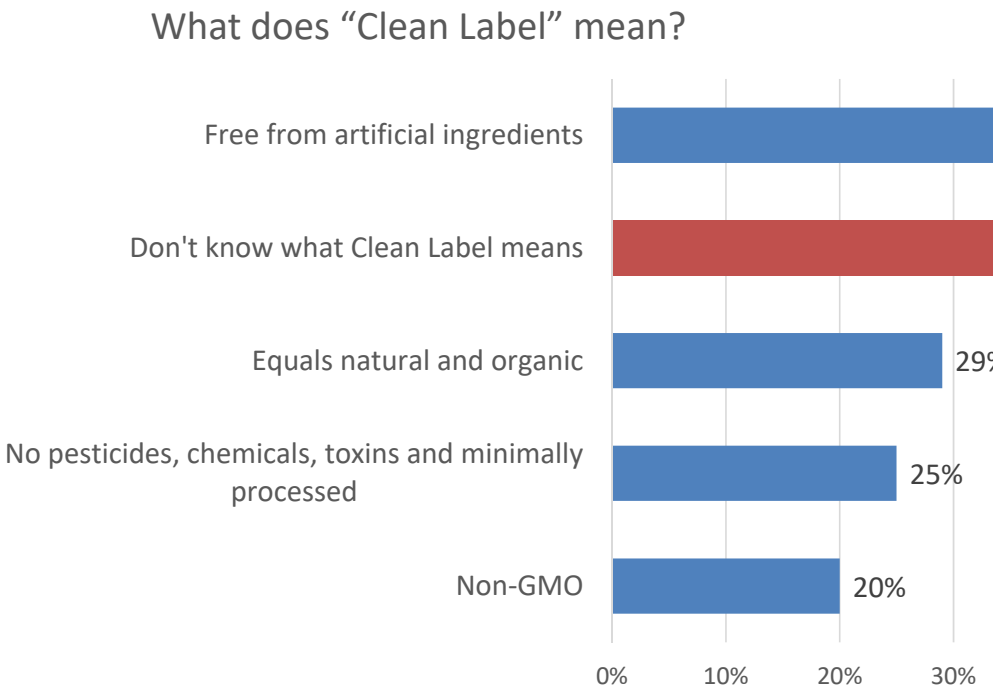
Industry

What Consumers Look at on Package



Source: Foodways of the Younger Generations: Millennial and Gen Z 2016 report, Hartman Group

Consumer Perspective

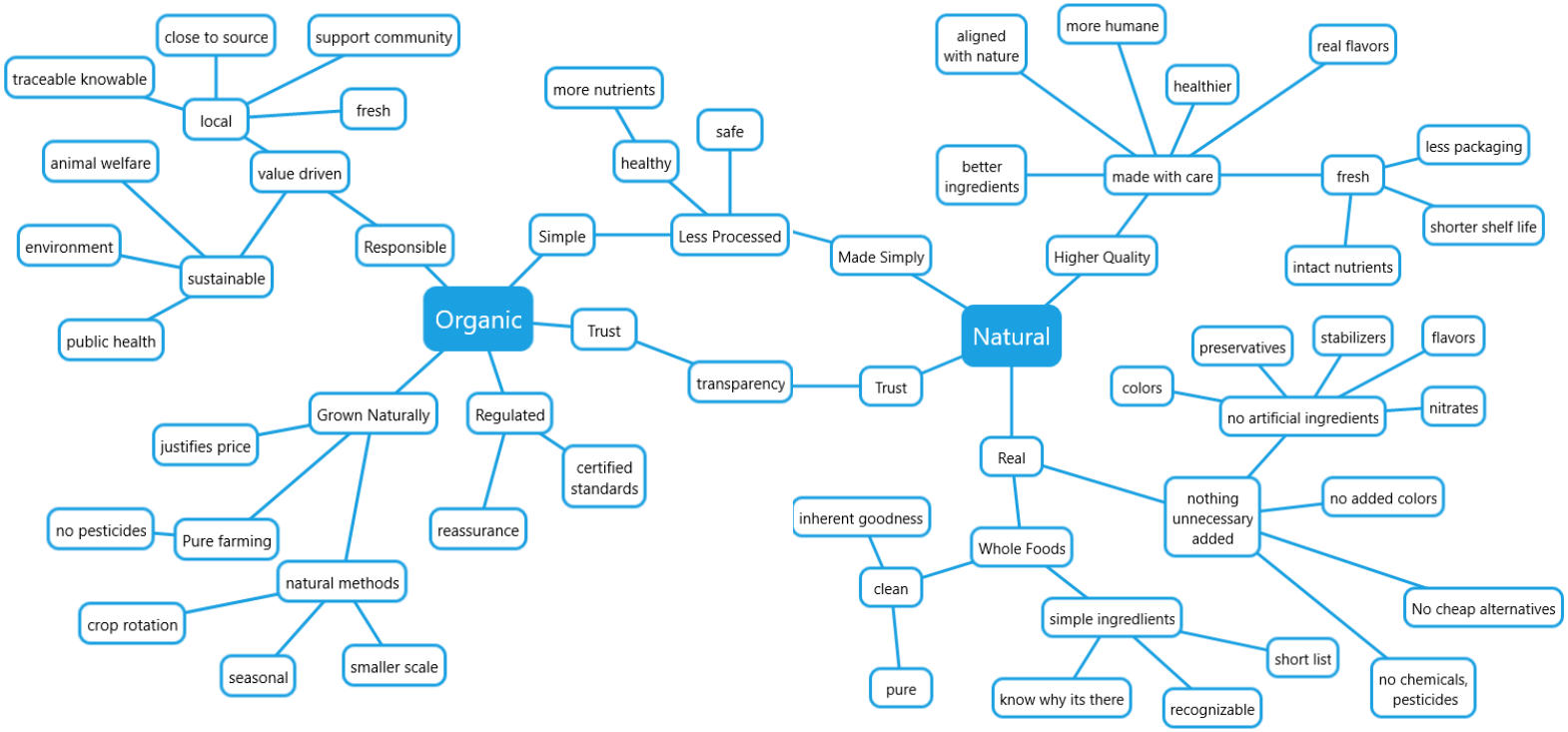


- According to a survey:
  - **65%** of consumers look for the shortest list of ingredients
  - **58%** of consumers look for foods with only ingredients I recognize

Source: Clean Labels: What consumers are saying?, Canadian Global Survey Q4 2015

Source: Health + Wellness Report 2017, Hartman Group

Language of Consumers



Source: Organic & Natural 2016 Report; www.Hartman-group.com

Consumer's Meaning of Terms

"Organic"	• What happens to the food from it's origin and all the way to the customer • Considered more natural
"Natural"	
"Clean"	

Grown without chemical fertilizers or pesticides and sold without adding preservatives and or synthetic food improvers

Use only organically produced ingredients except for water and salt

- ✓ **May display USDA Organic seal**
- ✓ **May display certifying agency**

Consumer's Meaning of Terms

"Organic"	
"Natural"	• Is what happens to the food after it is grown • Sometimes considered a marketing term
"Clean"	

US “Natural” Policy

FDA

- Not defined, but policy statement issued in 1993
- **Product contains NO:**
  - Artificial or synthetic ingredients
  - Added coloring, regardless of the source

USDA

- Labeling guidance issued
- **Product contains NO:**
  - Artificial flavor or flavoring
  - Coloring ingredient
  - Chemical preservative
  - Artificial or synthetic ingredients
  - Minimally processed

Consumer’s Meaning of Terms

“Organic”	
“Natural”	
“Clean”	• Goes beyond organic and natural • Considered fresher, safer, healthier • No chemicals, nothing artificial, less processed • Does not have an official FDA or USDA policy

Consumer Perspective

- Consumers are looking for
  - Shortest ingredient list
  - Recognizable ingredients
  - Minimally processed
  - Nothing artificial
  - No chemicals
  - Transparency

Industry Perspective

Ingredients Perspective

- Our standard formulas contain:
  - Major ingredients
  - Minor ingredients
  - Micro-ingredients or Additives

Major Tortilla Ingredients

- Flour 100
- Water 45 – 55
- Fat 2 - 10



Minor Tortilla Ingredients

- Baking powder 1 - 2.5
- Salt 1 – 2.5
- Sugar 0 – 2.5



Micro Tortilla Ingredients

- Yeast
- Colors and flavors
- Thickeners
  - starches, gums, CMC
- Preservatives
  - Calcium Propionate, Potassium sorbate
  - Fumaric acid, phosphoric acid
- Emulsifiers
  - SSL, mono- diglycerides, Datem
- Reducing agents
  - L-Cysteine
- Oxidizing agents
  - Ascorbic acid, potassium bromate

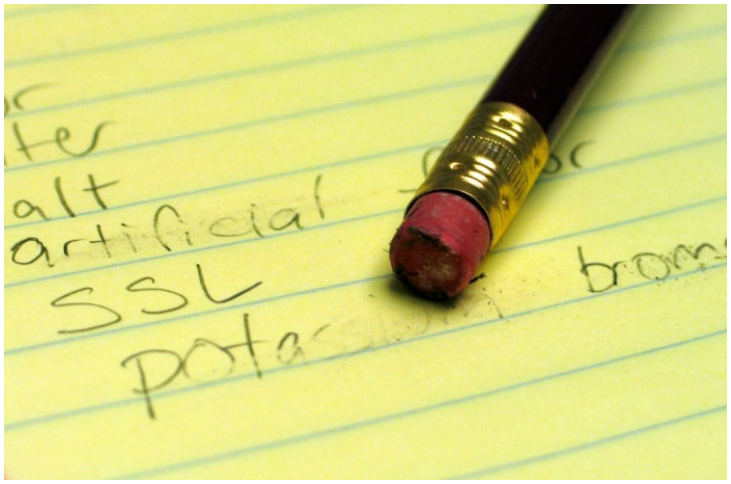
Why do we need the extra additives?

Reducing agents:	Improve dough machinability
Oxidizing agents:	Improve dough tolerance
Emulsifiers:	Improve texture & bind water/fat
Preservatives:	Protect from molds
Acidulants:	Activate the preservatives
Gums:	Bind water
Colors & flavors:	Extend product line

- No “common” definition of clean label.
- Several places have lists
  - Whole Food’s unacceptable ingredients list
  - National Organic Program
  - Other retailers, customers, consumer groups

USDA NOP list: 7 CFR 205.605 & 205.606

- We know we need to remove:
  - Artificial flavors
  - All colors not naturally in the food
  - Chemical preservatives
  - Synthetically produced ingredients



- Removing or replacing artificial ingredients can lead to textural, quality, and shelf-life changes in the product
- Preservative removal can lead to microbial growth (mold)
- Consumer expectations of product shelf-life

- Removed ingredients provide processing tolerance
- Tortilla bakeries are low margin and must maintain high production throughputs, speeds
- Alternative ingredients more expensive
  - Consumers may not be willing to pay more

Concerns for Consumers: Shelf Life

- Visible mold growth = “spoilage”

- Firmness or crumbliness of crumb
- Loss of flexibility, Dryness, Flavor loss and/or change

How can we extend the shelf life with “clean” ingredients?

- Use alternative ingredients
- Reduce the “water activity” of your product
- Apply thermal processes like freezing
- Work on packaging
- Establish very strict sanitary controls on your facility environment, employees and process.

Alternative Ingredients

Preservatives Types

- Natural
  - Vinegar
  - Raisins
  - Fermented starch, flour, or whey
- Chemical
  - Propionates
  - Benzoates
  - Sorbates
  - Acetates
  - Parabens

Mold Inhibitors: Natural

- Raisins contain tartaric and propionic acids
- You could use: Whole raisins, Raisin juice concentrate, Raisin paste
  - The strong flavor and dark color limit the usage to darker products

Mold Inhibitors: Cultured

- Fermented or Cultured products
  - Based on fermenting flour, starch, or whey.
  - Made by culturing lactic acid bacteria
  - More expensive than artificial options
  - Labeled as “cultured whey” or “cultured wheat starch”

Replacing Artificial Flavors

- Replace with:
  - Natural flavors
  - Spices
  - Processing

Replacing artificial colors

- Adds visual appeal to product
  - People eat with their eyes
  - Associate colors to perceived flavor or quality

vs.

Taking out Artificial Colors

- For clean label, consider naturally sourced colors and extracts
- Natural colors may be softer, less identifiable
- Pigments can interact with other ingredients
- May not be stable and affected by storage or processing conditions

Taking out Stabilizers

Common Types

- Starches
  - Native
  - Modified
- Gums (hydrocolloids)
  - Synthetic
  - Natural

“Natural” Sourced Gums

Plant Extrudate	Seaweed Extract	Seed Gum
Gum Arabic	Agar	Guar
Karaya	Carrageenan	Locust bean
Tragacanth	Alginate	Tara
Ghatti		
Microbial Gum	**Fruit Extract**	**Root Extract**
Xanthan	Pectin	Konjac
Gellan		Inulin
Cellulose Gum		
CMC		

Oxidant Alternatives

Traditional Oxidants

- Non synthetic ascorbic acid
- Bromates (potassium and calcium)
- Calcium peroxide
- Azodicarbonamide (ADA)
- Ascorbic acid

Alternatives?

Reducing Agent Alternatives

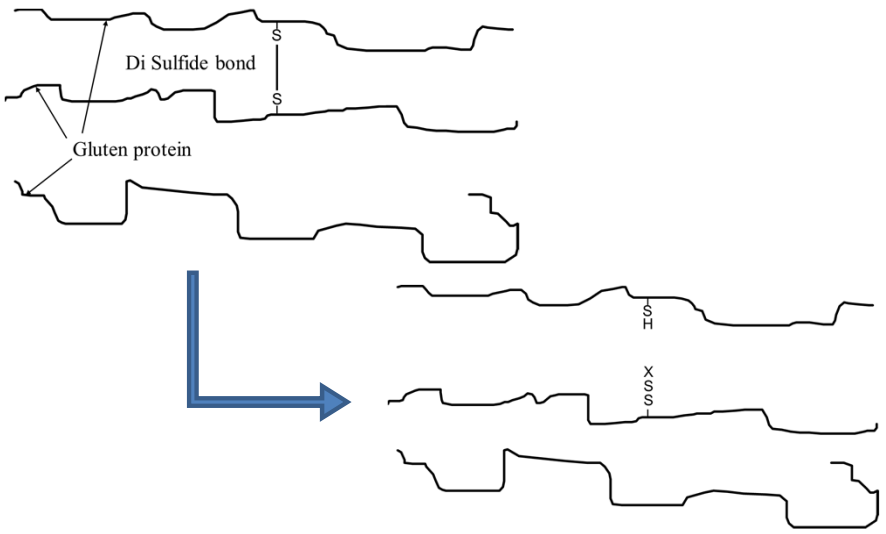
Traditional Reducing Agents

- Enzymes like protease
- Inactive dry yeast
- L-cysteine
- Sorbic acid
- Fumaric acid
- Sodium bisulfite

Alternatives?

Inactive Dry Yeast

- When yeast autolyzes it produces glutathione
- Functions as a reducing agent
- Label friendly



Emulsifier Alternatives

Traditional Emulsifiers

- Enzymes
- Lecithin
- Gums
- Mono and di glycerides
- Sodium & calcium stearoyl lactylate (SSL & CSL)
- DATEM
- Ethoxylated Mono
- Sucrose esters
- Polysorbates

Alternatives?

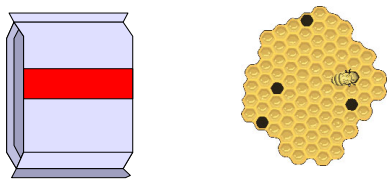
Lecithin

- "Natural" emulsifier
- Generally by-product of soybean oil or sunflower oil production
  - Blend of 3 phospholipids, which are the active ingredients
  - Also in eggs
  - Increased volume / crumb fineness

Reducing Water Activity

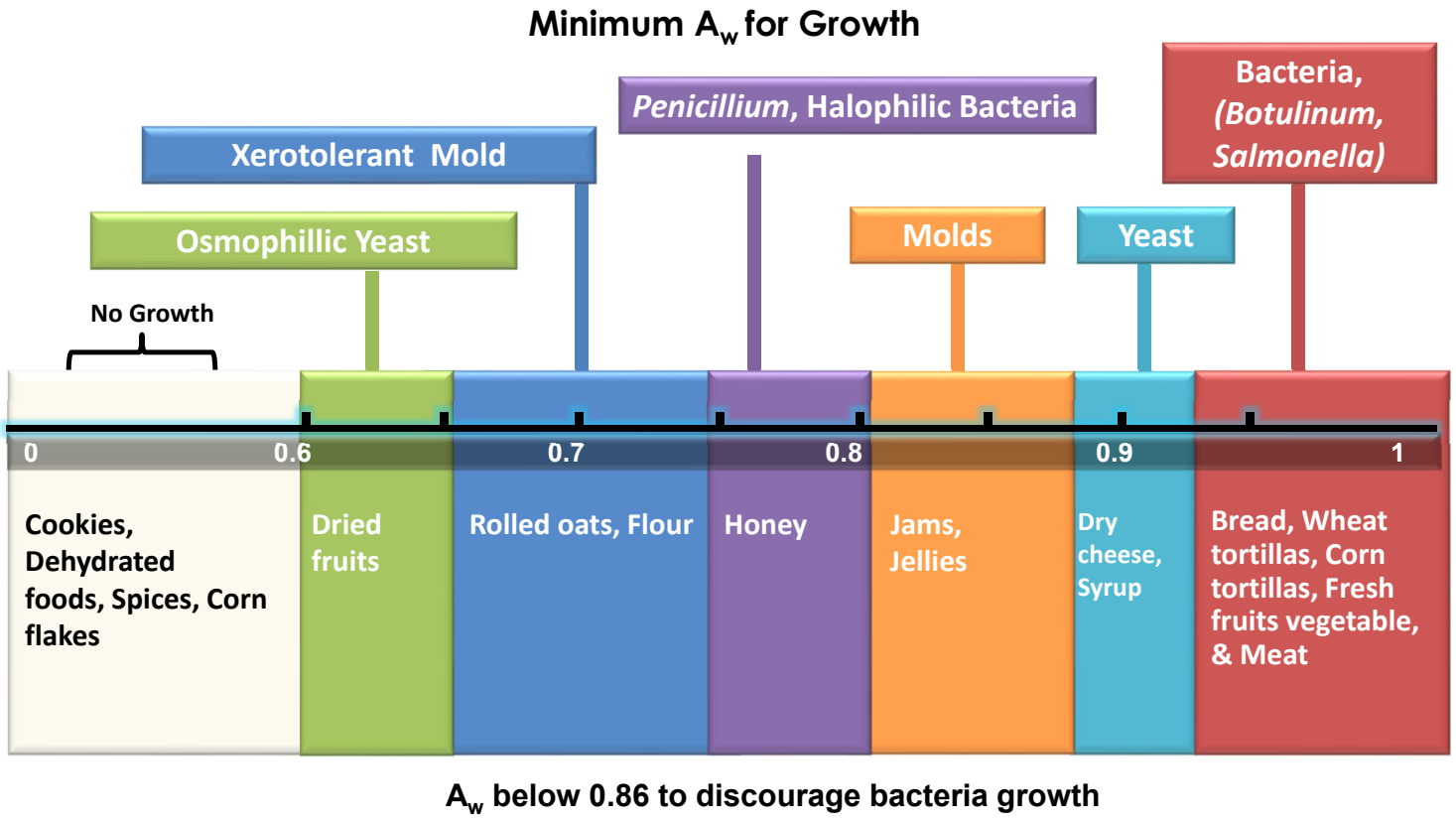
Reducing Water Activity

- Water activity is a measurement of the amount of “free” water in a system
  - Measures the amount of water available for chemical reactions (microbial growth)
- Water activity is NOT water content



17% Moisture

Water activity



Ingredient Impact on Water Activity

- Effective ingredients to change aw
  - Low molecular weight
  - Dissolved

Examples:

- Sugars
- Salts
- Alcohols
  - Glycerol (glycerine)
- Small proteins
  - Amino acids
  - Hydrolyzed proteins

Thermal processes: Freezing

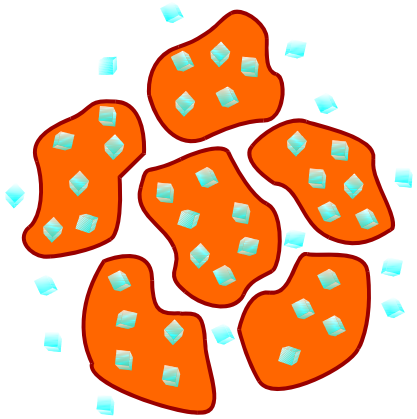
What does freezing do?

- Freezing turns water into ice
  - Ice crystals take more space than the water
- Quick freezing creates infinite small crystals
- Slow freezing creates large crystals that damage product structure
- Freezing is bio-static meaning that it slows down all the biological processes
  - Freezing is not bio-cide it does not kill contamination

Freezing

Slow freezing

Fast freezing



Mechanical Blast Freezing

- Spiral Freezers:
  - "Mechanical" because the cold temperatures are created by compressing and expanding a refrigerant
  - Common refrigerant is ammonia gas

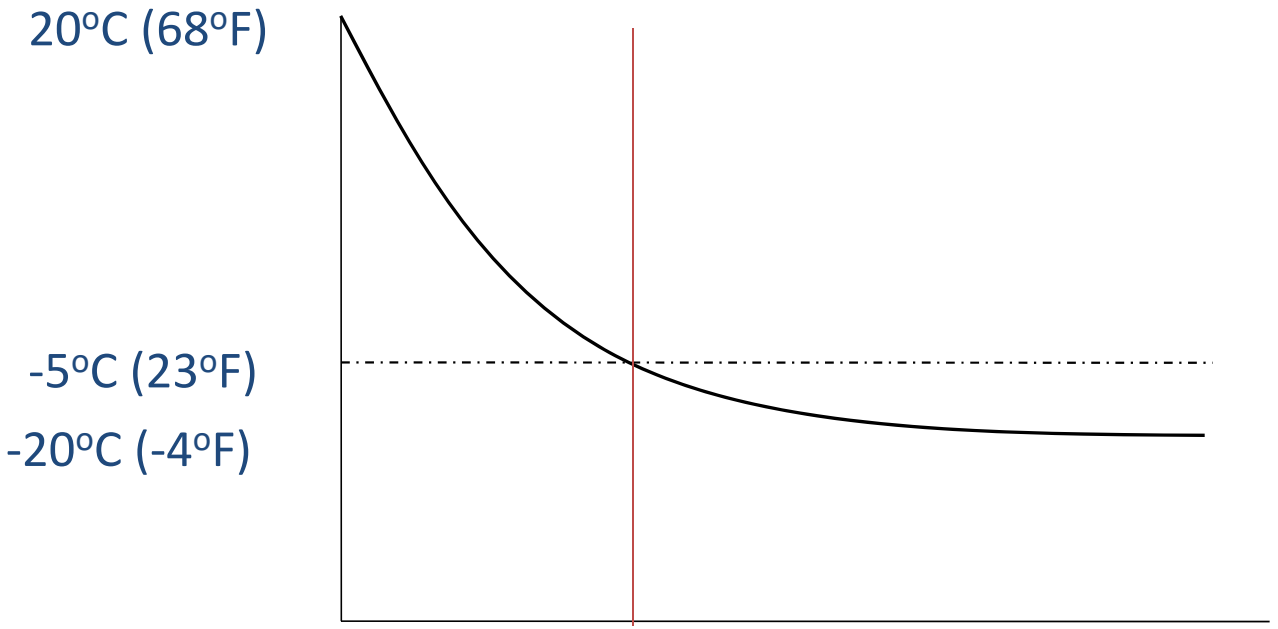
Cryogenic Freezer

- Time: 1 to15 minutes
- Over freezing possible

Two Stage Freezing

- Blast Freezer:
  - Sets crust
  - Reduces core temperature
- Holding freezer:
  - Slowly freezes dough down to desired holding temperature
  - Allows cells to prepare for long term storage

Two Stage Freezing Curves



Packaging Options

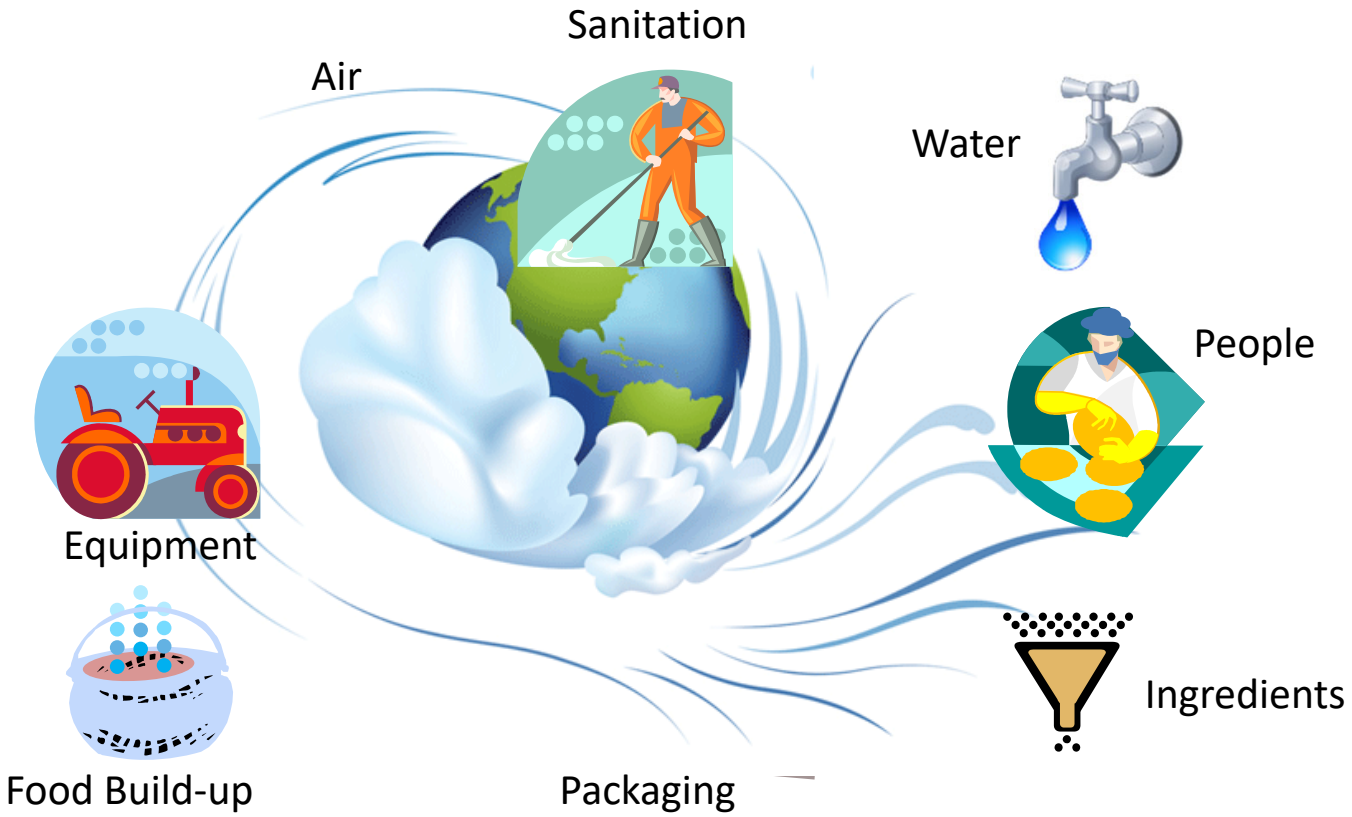
Special packaging

- Modified atmosphere
- Oxygen absorbers

Oxygen absorbers are tiny sachets that contain iron filings, salt and clay.

The iron filings oxidize, forming rust that releases nitrogen.
The lack of oxygen in the stored food will delay the mold growth

Sources of Microbes



Takeaway

- Producing clean label tortillas is a reality but consider:
  - Standard additives will need to be replaced by clean ones
  - Replacement additives are less efficient and more expensive than the standard
  - Your product will be different from your standard and those differences need to be approved by your customer

Takeaway

If you are moving towards clean label you may need to:

- First: explain the limitations to your customer as the product may not be identical to your standard
- Establish very strict sanitary controls on your facility environment, employees and process.
- Use alternative ingredients to regain functionality & ingredients that reduce the “water activity”.
- Apply thermal processes like freezing
- Work on packaging