



The art of **BLENDING**

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- 🌿 **Smart blends ➡ Smart ingredients ➡ Smart solutions**



MARKET TRENDS

Why is this market
a potential opportunity?

Tortilla market in a glance



Market value \$12,324.4 Mn

Tortilla Market is projected to be valued at US **\$12,324.4 Mn** by 2028 end.

3.7% CAGR

Tortilla market is expanding at a CAGR of 3.7% during the forecast period 2018 - 2028.

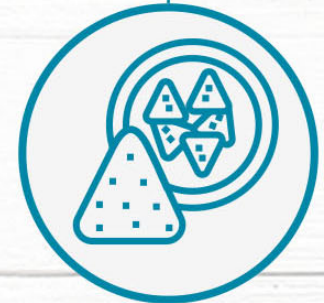


Latin America the greatest market

With a revenue share of +48% in 2017, **Latin America clearly dominated the global tortilla market**, in terms of value sales, substantially driven by the rapidly growing Hispanic population in the U.S.

Higher Tortilla Chips consumption

Tortilla chips are expected to witness significant **consumption** in the coming years.



Source: IBIS World

Tortilla market in a glance



40% buy tortilla products

More than **40% consumers** buy tortilla products on a weekly basis.



Elements for Consumption increases

Busy lifestyles, convenience, health conditions and urban working population are **elements contributing to the consumption increase of tortillas.**

Tortilla Production increased

This is predicted in the coming years - mostly supported by **population growth**, especially among Hispanics, as well as the **consumption preferences.**



50% use supermarkets

50% consumers buy from modern trade stores like hypermarkets and supermarkets.



Source: IBIS World

Tortilla market in a glance

Traditional Tortillas in New Convenient, Flavored Formats to Push Global Adoption



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The global tortilla market has witnessed a launch increase of new products containing **innovative flavors** over the last years.



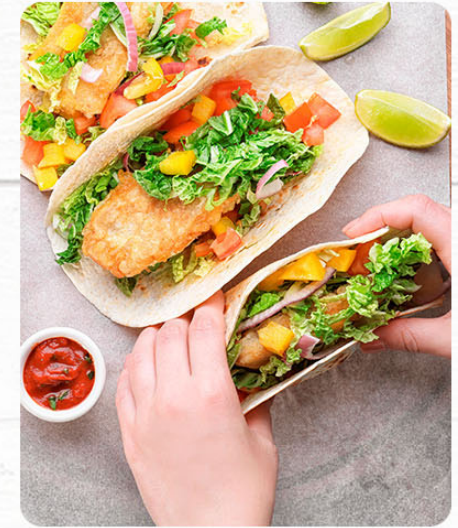
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Organic or gluten-free new products are being increasingly adopted in Americas, primarily attributable to health benefits.



• • •

FDA approved the use of folic acid for fortification in corn masa flour products, allowing manufacturers to add up to 0.7 milligram per pound, has opened up new opportunities to explore new formulations.



• • •

Food manufacturers such as **Bunge**, offers **corn masa flours and a wide variety of shortenings** to help create products that meet consumer demands.

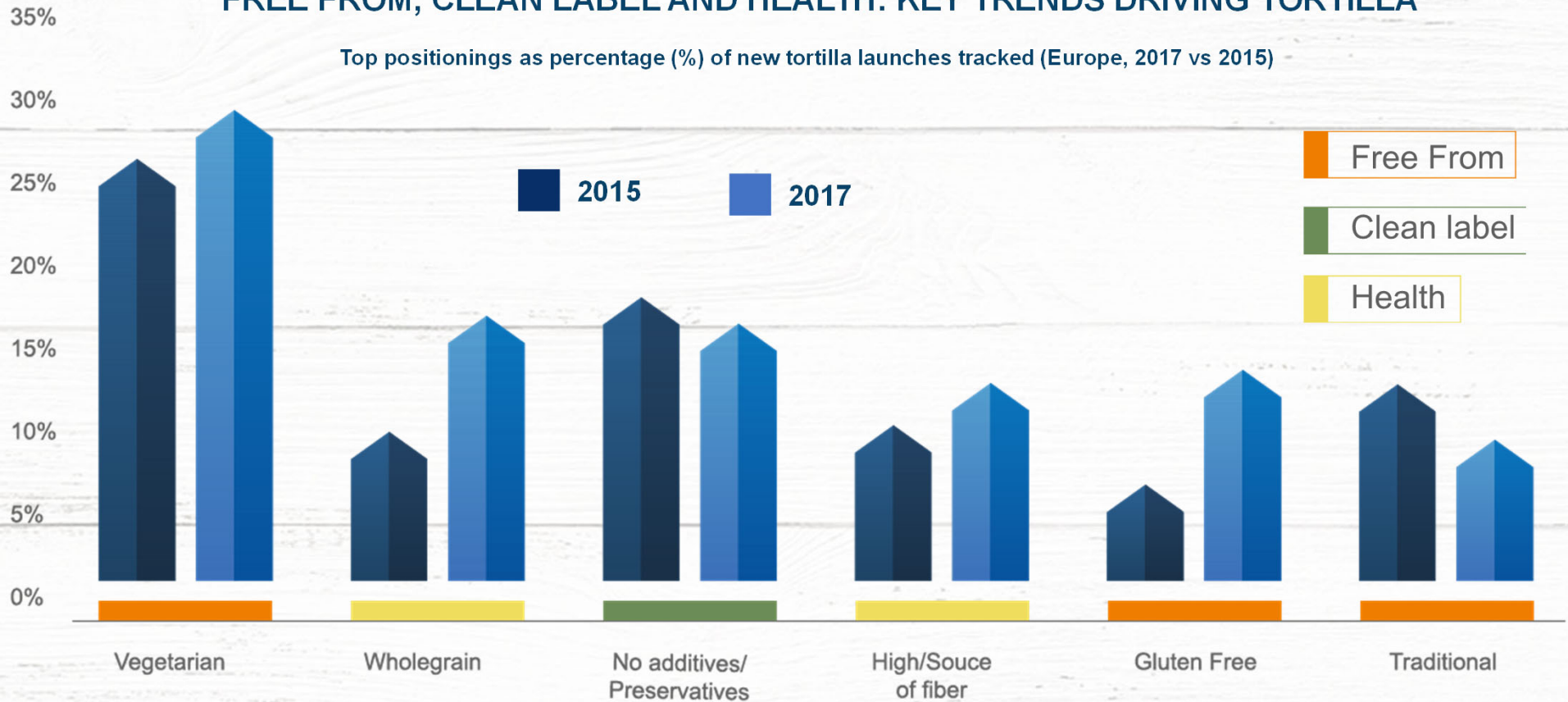
Source: IBIS World

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Market differentiators to increase more share: What and How? Industry overview

FREE FROM, CLEAN LABEL AND HEALTH: KEY TRENDS DRIVING TORTILLA

Top positionings as percentage (%) of new tortilla launches tracked (Europe, 2017 vs 2015)



Source: IBIS World

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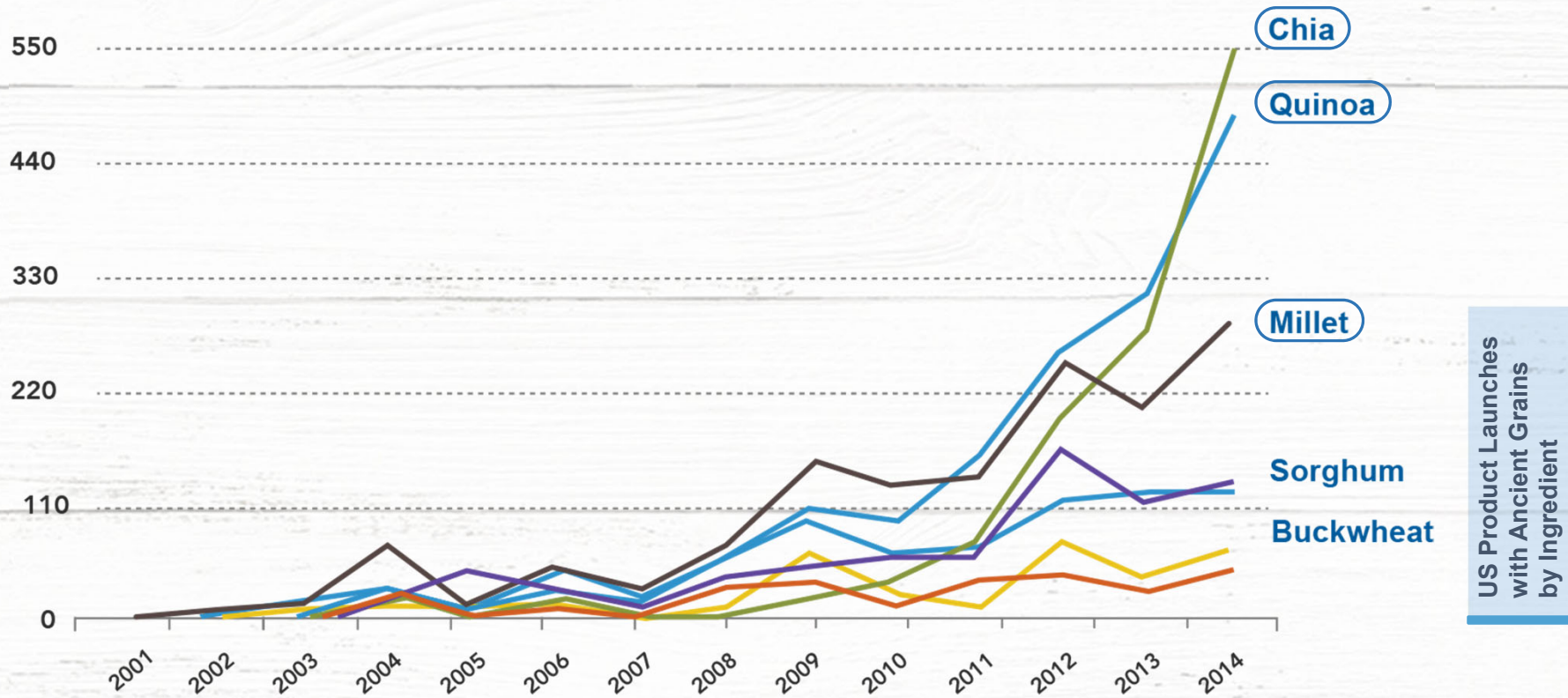
Market differentiators to increase more share: What and How? Global food trends

Grains based food are key Strategic Drivers

	LESS PROCESSING	HEALTH	TRANSPARENCY	FLAVOR	SNACKING	EATING OUT
NATURAL ORIGINS	✓	✓	✓	✓		
HEALTHIER CHOICES	✓	✓	✓			
SENSORY EXPERIENCE	✓			✓	✓	
CONVENIENCE & VALUE					✓	✓

Market differentiators to increase more share: What and How? Global food trends

Ancient Grain Products Exploding In Popularity



Retail product launches containing ancient grains have exploded over the past couple of years and show no signs of slowing as more manufacturers enter the growing segment.

Market differentiators to increase more share: What and How? World grains categories

CEREALS

Grass family, high in carbohydrates

Warm-season

Finger millet
Fonio
Foxtail millet
Japanese millet
Kodo millet
Maize (corn)
Pearl millet
Proso millet
Sorghum

Cool-season

Barley
Rye
Barley
Oats
Rice
Spelt
Teff
Triticale
Wheat

PSEUDO-CEREALS

Broad leaf plant families

Amaranth
Amaranth family

Buckwheat
Smartweed family

Chia
Mint family

Quinoa
Chimopodium family

Kaŋiwa

Kiwicha

PULSES

Pea (pods)
Family, higher protein

Chickpeas
Common beans
Common peas
Fav beans
Lentils
Lima beans
Lupins
Mung beans
Peanuts
Pigeon peas
Runner beans
Soybeans

OILSEEDS

High oil

Mustard family

Rapeseed
Black mustard
India mustard
Canola

Aster family

Sunflower seeds
Safflower
Sunflower

Other families

Flax seed (flax family)
hemp seed (hemp family)
poppy seed (poppy family)

Market differentiators to increase more share: What and How? Ancient grains benefits

"THE SUPERFOOD of the Future"

Definition: Ancient grains are those seeds that have not been altered or genetically modified over the time.

BENEFITS

- ↓ Flavor
- ↓ Nutrition
- ↓ Fiber
- ↓ Antioxidant
- ↓ Clean label
- ↓ Essential vitamins

10 GRAINS TO KNOW

The most popular specialty grains and seeds possess different nutritional benefits and have variety of uses.

QUINOA

High in protein, amino acids
Gluten-free.
Used as side dish, cereal.
Origin: South Africa.

SORGHUM

High in protein, iron
Gluten-free.
Used for cereal, syrup.
Origin: Africa.

MILLET

High in magnesium, phosphorus.
Gluten-free.
Used for flours, snacks.
Origin: Asia and North Africa.

SPELT

High in protein, manganese
Low gluten.
Used for flour, pasta.
Origin: Near East and Europe.

TEFF

High in protein, calcium
Gluten-free.
Used for flour, grain.
Origin: Ethiopia.

BUCKWHEAT

High in protein, phenols
Gluten-free.
Used for flour, noodles.
Origin: Southwest China.

CHIA

High in fiber, Omega 3.
Gluten-free.
Used in snacks, beverages.
Origin: Southern Mexico.

FARRO

High in fiber, magnesium, vitamins,
Low gluten
Used in bread, matzo.
Origin: Turkey and Near East.

KUMUT

High in fiber, antioxidants
Low gluten
Used in breakfast, cereal, pasta.
Origin: Egypt.

AMARANTH

High in protein, amino acids.
Gluten-free.
Used in bread, crackers.
Origin: Central America.

FINISHED
FOOD
DESIGN
*winning
with
sensitivity*



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Finished food design – Winning with competitiveness

Optional grains and ingredients
Development of targeted Grain-Based Functional Ingredients, by design. Portfolio of functional flours is expanding.



Grain Formulation

Corn
Rice
Wheat
White Sorghum
Pearl Millet
White & Red
White Quinoa
Sunflower
Masa
Corn & Sorghum



Processing Tech

Grain fractionation
Thermoplastic Cook
Low Shear Cook
Medium Shear Cook
High Shear Cook
Hot air puffing



Functional Property

Water Absorption
Adhesiveness
Cohesiveness
Swelling
Binding
Stabilizers
Thickeners
Extenders



Food Application

Breakfast Food
Snacks
Drinks
Filings
Coating
Baking
Crackers
Cookies
Batters

Tortillas & Chips

Finished food design – Winning with competitiveness Alternative food additives

TEXTURE



Hydrocolloids/Gums:

CMC, Xanthan, Carragenan

Enzymes:

Barley Malt, Amylases, others

Glycerides:

Mono & Diglycerides, Glycerin

COLOR



Acids:

Fumaric, Phosphoric Calcium or Benzoyl,

Oxidants:

Peroxide, Titanium Dioxide, others.

Lime (Calcium Hydroxide)

SHELF LIFE



Alkali:

Ca or Na Propionate, K Sorbate, Fumaric,
Phosphoric, Sorbic, Lime

NUTRITIONAL



Preservatives:

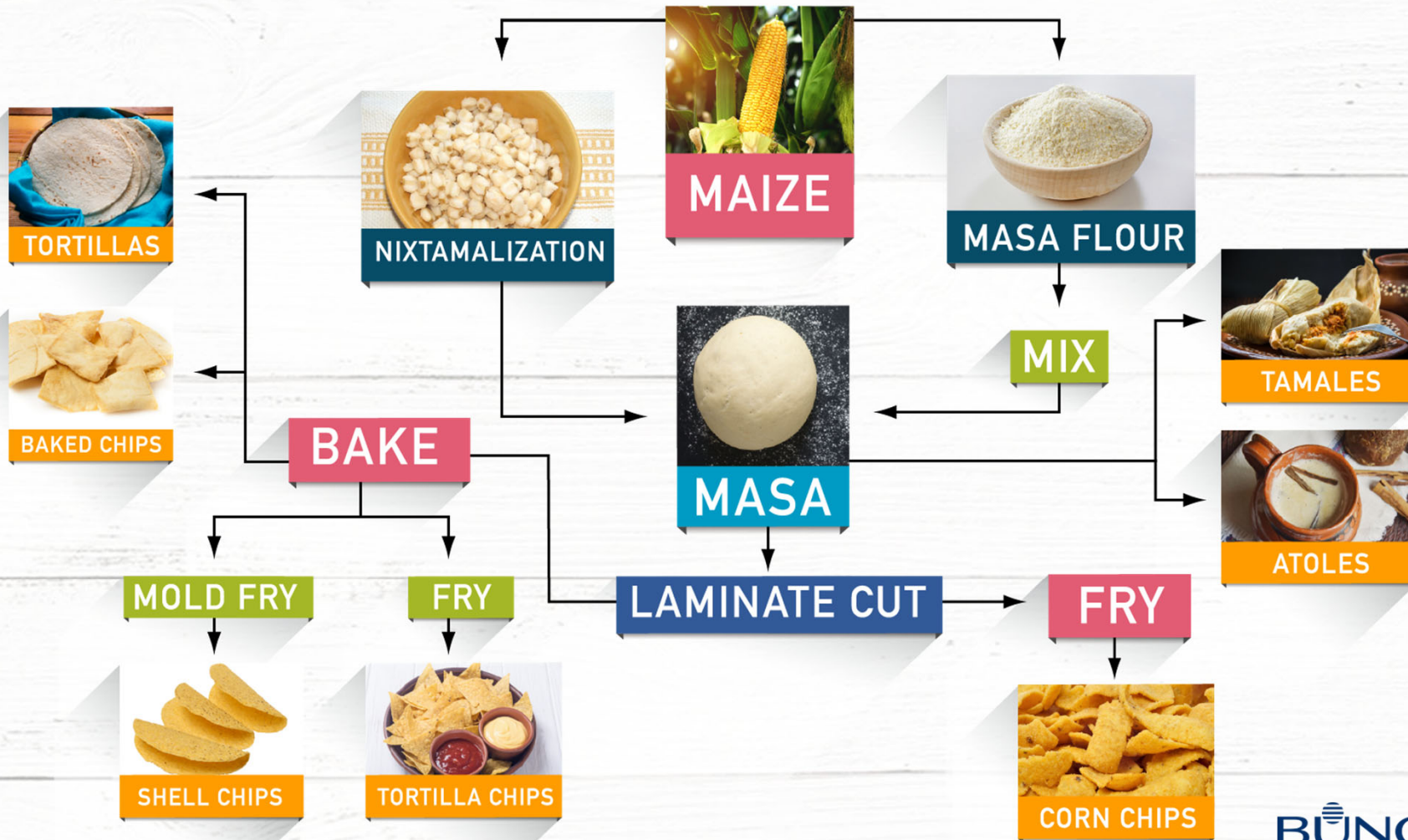
Vitamins, amino acids, multigrain,

Acids:

Fiber (cereal, fruit) legumes, ancient grains, others

Alkali:

Finished food design – Winning with competitiveness A complete universe of commercial masa food products



Finished food design – Winning with competitiveness Snacks – comparative review

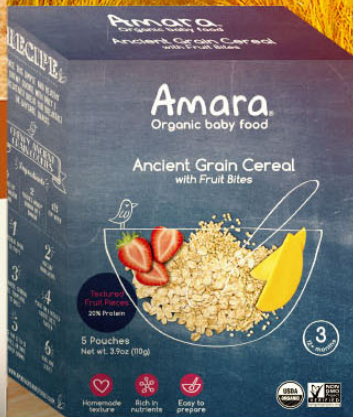
SNACKS	PRODUCTS	MAJOR INGREDIENTS	KEY PROCESSES
Potato Chips	Potato Chips Pringles	Potatoes, potato, Granules/Flakes	Refrigeration/Cutting, Frying or Baking Dough Forming
Alkaline cooked	Tortilla Chips Corn chips	Corn, Calcium Hydroxide	Cook/Grind/Sheet/Cut. Fry or Bake Dough Forming
Extrusion (DX)	Corn swirls, Cheetos	Corn, Rice, Wheat, etc	Dry mixig High Shear Extruder
Crackers	Cheez-it Wheat Thins	Wheat, Starch, others	Dough Equip./Sheet/Cut. Baking Shred Mills
Extruded Dough	Pretzels, Sticks	Wheat, Corn, Potato, others	Dough Forming Caustic Cooking Baking
Die Cut Pellets	Porn Skins, Rings, Tubes, Etc	Corn, Rice, wheat, potato	Extrusion Cook/Form Puff: Fryer/oven/Gun/Tower
Sheeted Pellets	3-D shapes Pillows	Corn, Rice, wheat, potato	Cook: Extrusion, Rotary Sheet/cut puffing
Other	Pop Corn Nuts	Corn	Tempering tunnels, hot air puffing, frying

Finished food design – Winning with competitiveness Food application

CRACKERS



BABY FOOD



BREAD



CHIPS



TORTILLAS



PASTA



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WHAT'S NEXT?

Leveraging our
expertise

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What's Next? Leveraging expertise

Key success factors- Search for your partners



MAINTAIN CONTACT WITHIN KEY MARKETS

Establishing contact and maintaining communication with several retail outlets ensures a reliable level of demand for wholesale grocery products.



GUARANTEED SUPPLY OF KEY INPUTS

Having access to, or contracts with, reliable manufacturers and processors will enable wholesalers to provide customers with a good variety of products.



PROMPT FAST DELIVERY TO MARKET

Establishments need to deliver their goods quickly and efficiently, specially because some foods are perishable.



ABILITY TO CONTROL STOCK ON HAND

The ability to maintain appropriate inventory levels keeps purchase costs and volumes steady and benefits profit margins.



EFFECTIVE QUALITY CONTROL

Establishments need to ensure shipments be on time and accurate without damaged merchandise in transit.



COST EFFECTIVE DISTRIBUTION SYSTEM

In an Industry with thin profit margins, having efficient warehouse and distribution systems is important for wholesalers to maximize profit.

What's Next? Leveraging existing expertise

OPPORTUNITY

- “Pop grains with visual kernel integrity”
- “Unique nutrition and flavor”
- “Simple and natural”
- “Snacks, Breakfast applications”
- “Visual integrity”
- “Sweet or savory flavors”
- “Whole multi-grains”

TECHNOLOGY STATUS

- Regional, artisanal presence
- Ethnically driven
- New developments

GRAINS

- Sorghum
- Pearl millet
- Quinoa
- Chia
- Amaranth
- Teff
- Buckwheat

PUFFING

- Hot air
- Frying
- Vacuum
- IR

TOASTING

- Hot air
- Frying – Deep
- Radiant

BARS

- Syrup Bind

FLOURS

- Physical process

Ancient grains technologies



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What's Next? Leveraging expertise

Nutrition Opportunity areas in corn – CIMMYT Breeding Program

F r p s r x q g		P d l h # w x f w h	U h o l y n # p s r u d q f h
Fiber	Soluble	Mainly in pericarp	Decrease glycemic index. Reduce the risk of diabetes
	Insoluble	Pericarp	Reduce risk of constipation, hemorrhoids and colon cancer
Phytic acid and inositol		Pericarp and aleurone layer	Antioxidant. Effect in colon and skin cancer
Phenolic compounds	Ferulic acid	Pericarp	Prevent oxidative stress
Anthocyanins and flavonoids	Antocianinas Flavonoles	Aleurone layer	Prevent oxidative stress, fibrosis and cell aging
Carotenoids	b-caroten, b-cryptoxanthin, a-caroten	Endosperm of yellow maize	Provitamin A activity
Xanthophils	<i>Lutein Zeaxanthin</i>		Prevent macular degeneration. Antioxidant.
Phytoestersols	Sitosterol, Stigmasterol Campesterol	Germ, pericarp, aleurone layer	Reduce cholesterol
Lecithin and Colin	Phosphatidil colin, ethanol amin, inositol, and serine	Germ	Cell aging. Reduce cholesterol
Policosanols	Octacosanol, Tricontanol Hexacosanol, Dotriacontanol	Pericarp and germ	Reduce cholesterol
Zn	Mineral		Conversion of Pro Vit A to Vit A- essential for vision
Sulphur cont. amino acids	Lys, Trp	Endosperm/Germ amino acids	Improve essential amino acids balance

What's Next? Leveraging expertise

Benefits of process & analytical instrumentation

- Evaluation of nixtamal, masa, tortillas and chips
- Assess processing parameters and controls
- Ingredient functionality
- Shelf stability evaluation
- Product development & Innovation
- Training
- QC & QA



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What's Next? Leveraging expertise

A partnership offer

- ✦ **With our strategic network of facilities,** specialized services and global and domestic logistics expertise, we effectively respond to the world's growing food demand.
- ✦ **Mills that create innovative quality ingredients** used by the most trusted names in the food industry.
- ✦ **Extrudates can be air-popped, fried, or baked, then seasoned for a variety of tastes and textures** that align with the demand for **healthier** snack choices.
- ✦ **Whole Harvest ancient grains brand, with millet, chia, quinoa, and sorghum**—naturally gluten-free, can enhance the **nutrition**, including fiber and amino acid profiles in applications, appealing to today's leading consumer segments.
- ✦ **With Bunge's line of corn masa, you have a single source of high-quality ingredients for all the tortillas, chips, and taco shells, that can be customized to meet any functional requirement:** color, granulation, or with special gums or enzymes to help achieve a desired taste, texture, and shelf life.



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What's Next? Leveraging expertise

Innovation infrastructure & capabilities

Grain Platforms


- 
1. **Corn Cooking and making of tortillas and chips**
 2. **Extrusion**
 - 1) Single Screw
 - 2) Twin Screw
 - 3) Pellet
 3. **Size Reduction**
 - 1) Hammer Mill
 - 2) Roller Mill
 - 3) Knife Mill
 - 4) Jet Mill
 4. **Corn Milling**
 5. **Dehydration**
 - 1) Oven
 - 2) Fluid Bed
 6. **Jet Cooking**
 7. **Seasoning Application**
 8. **Frying – Commercial**
 9. **Heat Pasteurization**

Shared Services

St Louis, MO

1. Grain Lab
2. Oils Lab
 1. Proximate Analysis
 2. Wet Chemistry
 3. Chromatography - GC/LC/LC-MS
 4. OSI/Oxidation Evaluation
 5. FTIR/FTNIR
 6. SFC/NMR
 7. DSC
 8. Microscopy
 9. Particle size Analyzer
 10. Viscosity
 11. Texture/Moisture/Color Analysis
3. Synthesis Lab
4. Bakery Lab
 1. Donuts, Cookies, Cake, Breads
 2. Pastries
 3. Icings
 4. **Tortilla's (wheat / corn)**
5. Full Line Culinary Kitchen

OVC Platforms

- 
1. **IE – 150 Gal**
 - 1) Chemical
 - 2) Enzymatic
 2. **Refining**
 3. **Bleaching**
 4. **Deodorization**
 5. **Hydrogenation**
 6. **Interesterification**
 7. **Crystallization**
 8. **Blending**
 9. **Flaking**
 10. **Fractionation**
 11. **Expeller Pressing**
 12. **Food Service – Frying Lab**
 13. **Sensory Lab**
 14. **Compound Coating**



THANK YOU

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