



Prime Masa Nixtamal Tortillas and Tortilla Chips

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TIA Europe 2024
Valencia, Spain

Innovations for a better world.

 **BÜHLER**



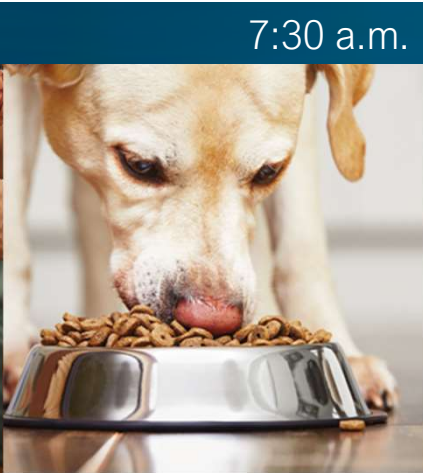
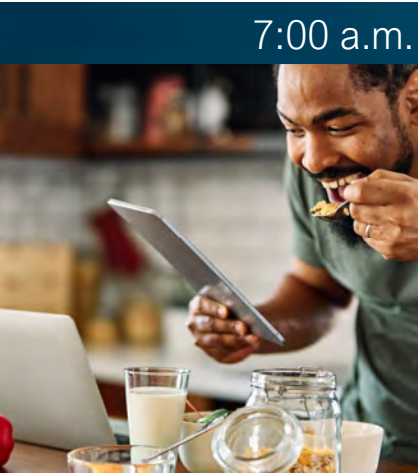
01

Bühler

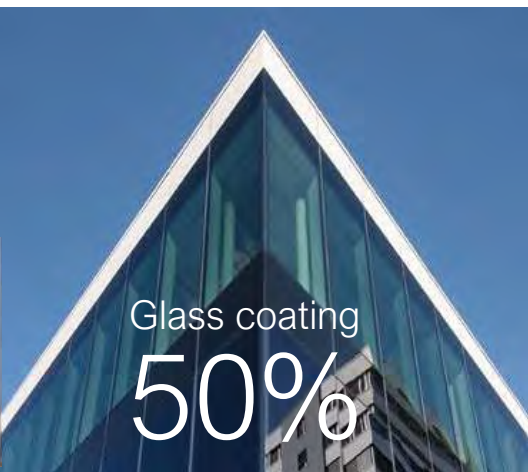
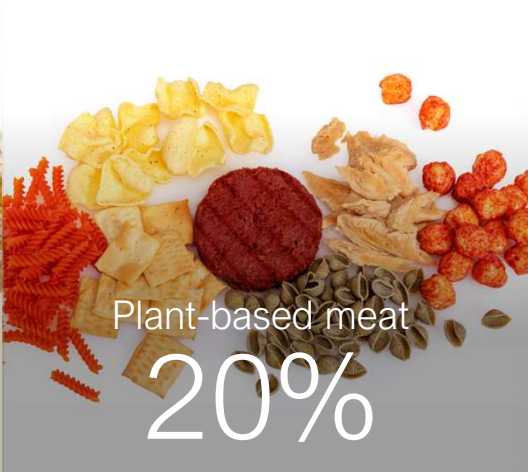


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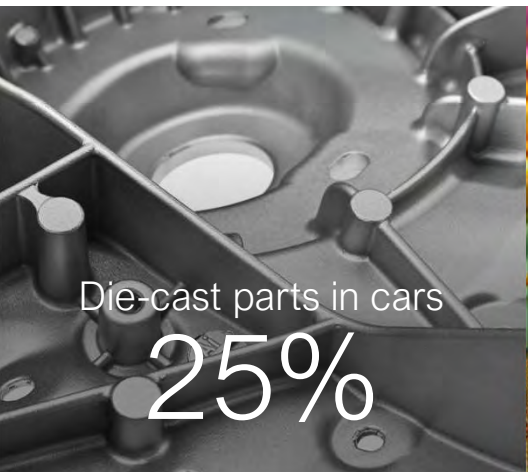
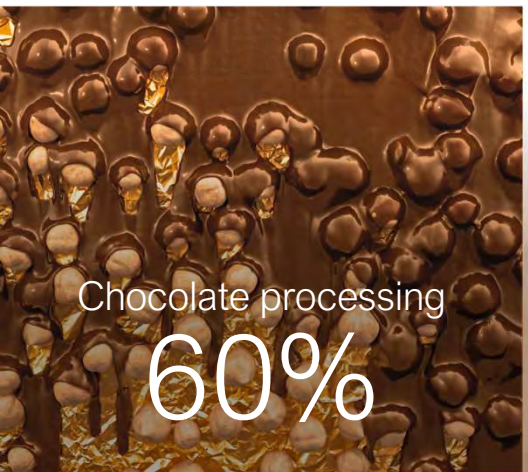
Bühler is part of the everyday life of billions of people



7:00 a.m. 7:30 a.m. 12:00 p.m. 6:00 p.m. 8:00 p.m.



Market leadership in the industries we are active in



Close to customers

Global network

Family owned

Innovation and education



12,500

FTE employees



140

Countries



CHF 3.0 bn

Turnover



5%

of turnover for innovation



51.1%

Equity ratio



02

Maize Table Tortillas &
Tortilla Chips Market

Market potential

fastest growing segment within the baking industry



Tortillas – ongoing popularity in central and north america



Tortilla Chips – Trend of snackification

13 mio ton
tortilla markets in
North and
Central America
alone

60 mio
Hispanic
Population in the
US today

280 bn tortillas
are consumed yearly
in the US

Global tortilla chips
consumption
exceeds
1.3 m tons
per year

Tortilla Trends Worldwide.

More Dynamics – More Potential.

MORE DEMAND FROM THE ENVIRONMENT



New flavors and ingredients



Fast food chain expansion



A driver of corn tortillas vs. wheat wraps



Conscious nutrition/ Whole grains/ added vitamins/ GMO banned

Example of diversification of Nixtamal Based Products Integration of new ingredients to enhance nutritional flavor

Similar Trend
in Tortilla
Table Market





03

Prime Masa Nixtamal



Innovative
process

PRIME MASA NIXTAMAL

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Prime Masa Nixtamal Process

Sustainable and innovative solution for maize tortilla flour



Prime Masa Nixtamal Flour



Different Cooking Methods

Traditional Nixtamal Method



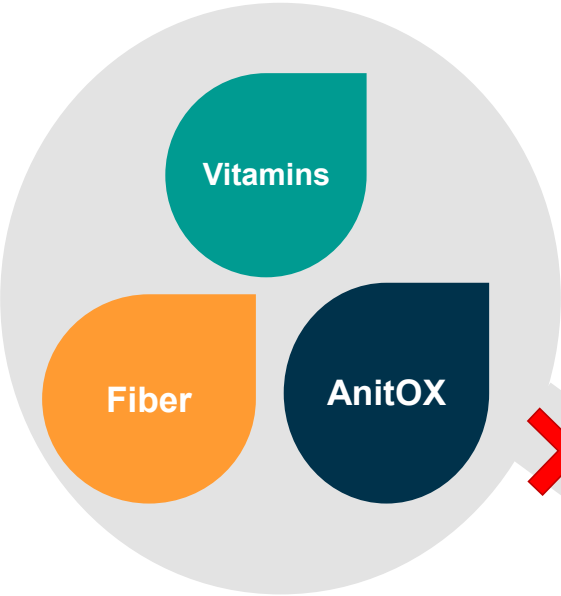
Cooking of maize in alkaline environment and water excess

Steaming / Prime Masa Nixtamal



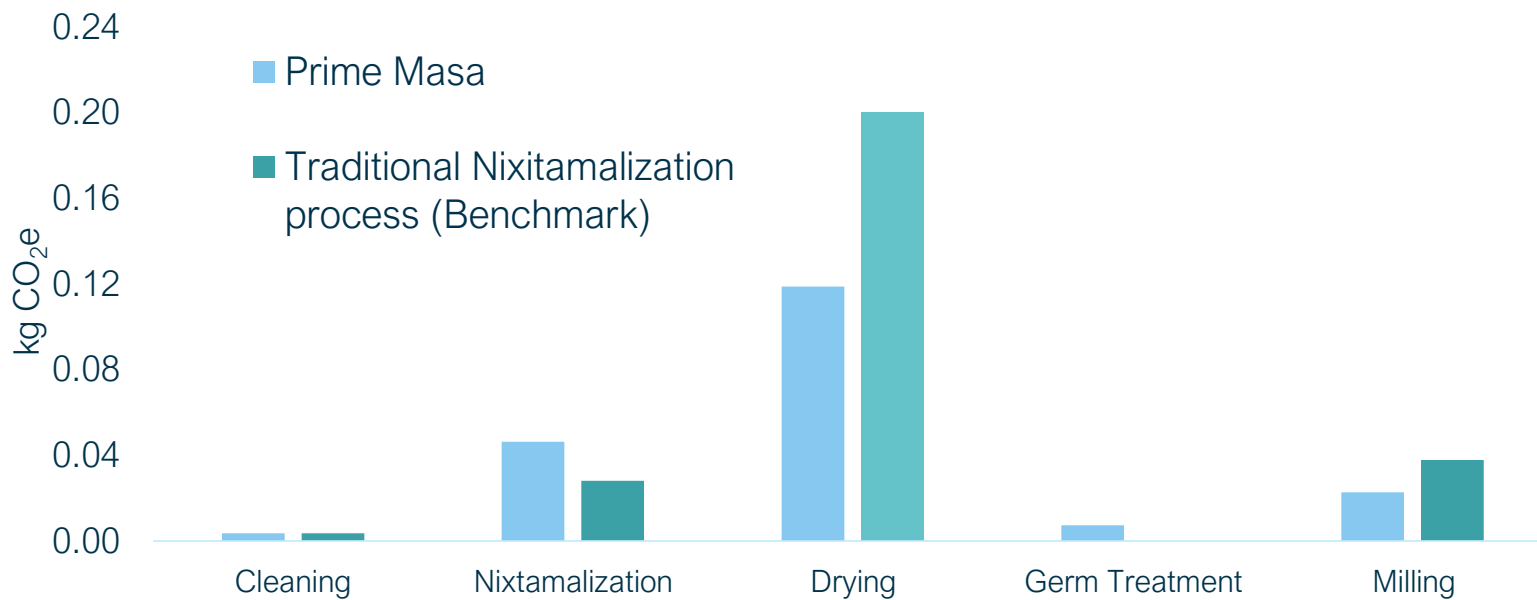
Cooking of maize in a steamer

Maintains Nutritional Values



Savings in the Plant due to Prime Masa Process

- 26.2% Reduction of CO₂e in the Plant



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- 52%

For cooking and drying compared to traditional process



- 96%

Due to elimination of waste water and better yield in Maize



- 84%

Due to steaming and flaking technology instead of soaking



1 kg of Prime Masa Flour saves
121 g CO₂e

8.4 million tonnes of
tortilla are consumed in
Mexico each year, saving
510'000 tonnes of CO₂e

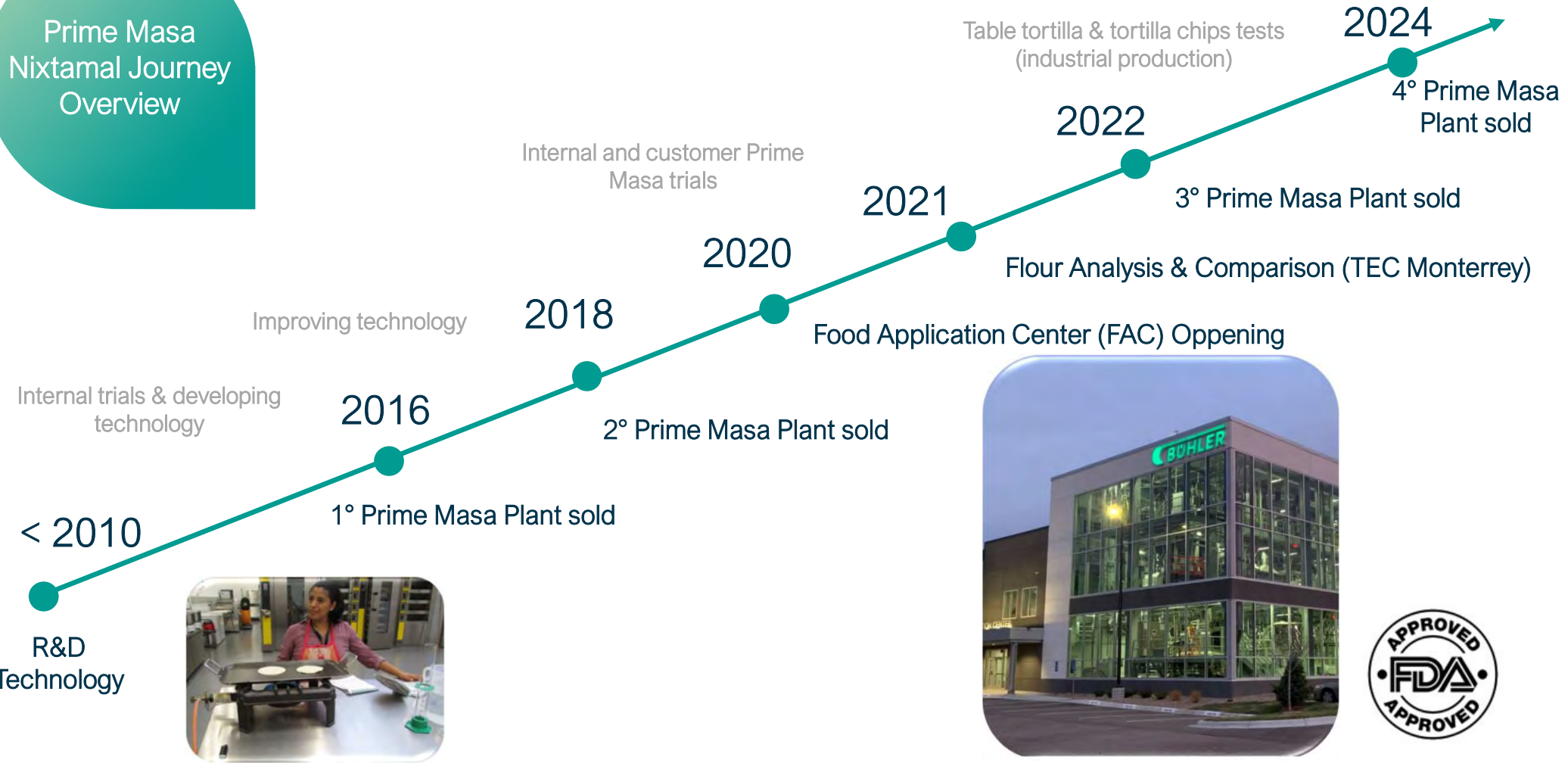
Equivalent to carbon
captured by 25 million
trees per year



04

Prime Masa Nixtamal
Industrial Test

Prime Masa Nixtamal Journey Overview



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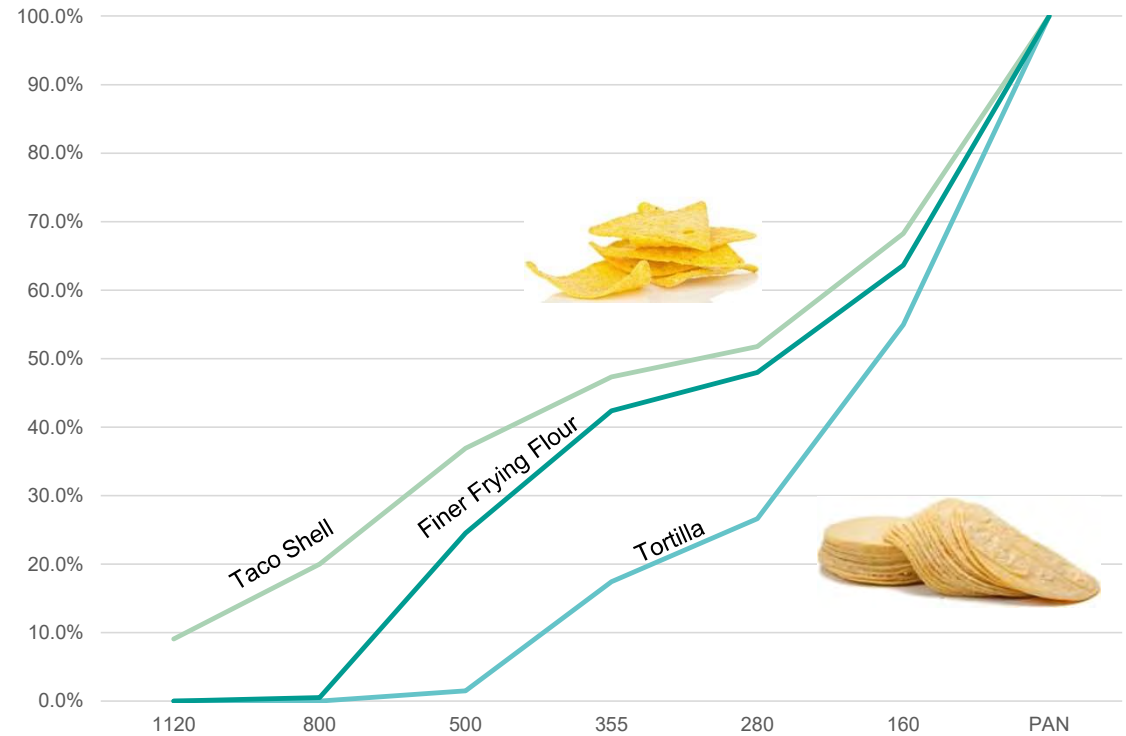


Prime Masa Nixtamal Flour Properties

- ❑ Moisture 8-12%
- ❑ Color, controlled by lime content
- ❑ pH 6-7, controlled by lime content
- ❑ Granulation: Fine for Tortillas Coarse for Frying.
- ❑ Gelatinization: High for Tortillas, Low for Frying.



Nixtamal Flour Granulations



Tortillas Test

Two main additives were added besides fortification
 Carboxymethyl Cellulose (CMC) & Enzymes (2 types)

Mixer capacity 90 kg
 Mixing time
 2 min dry + 6 min w/water
 Tortilla line capacity 500 kg/h



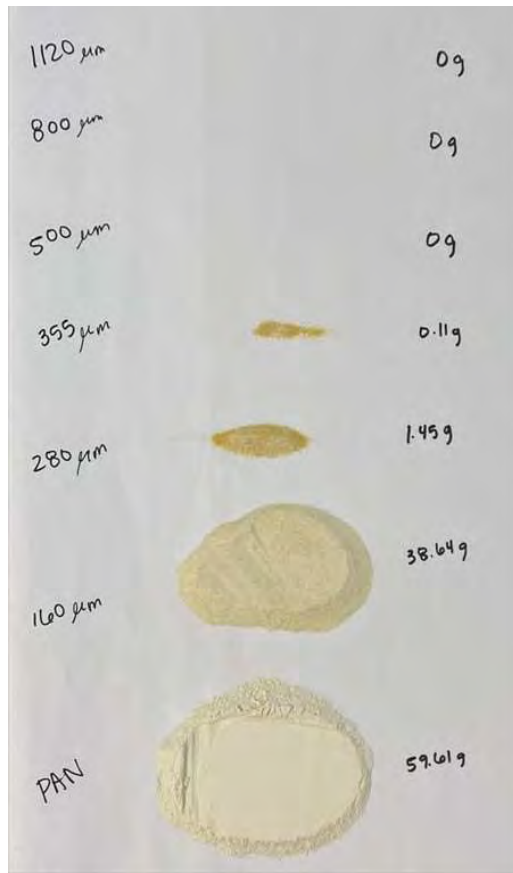
Tortillas were reheated for 30 sec each side at 205°C (after 4 weeks)

Samples 1 & 2
 Less lime content

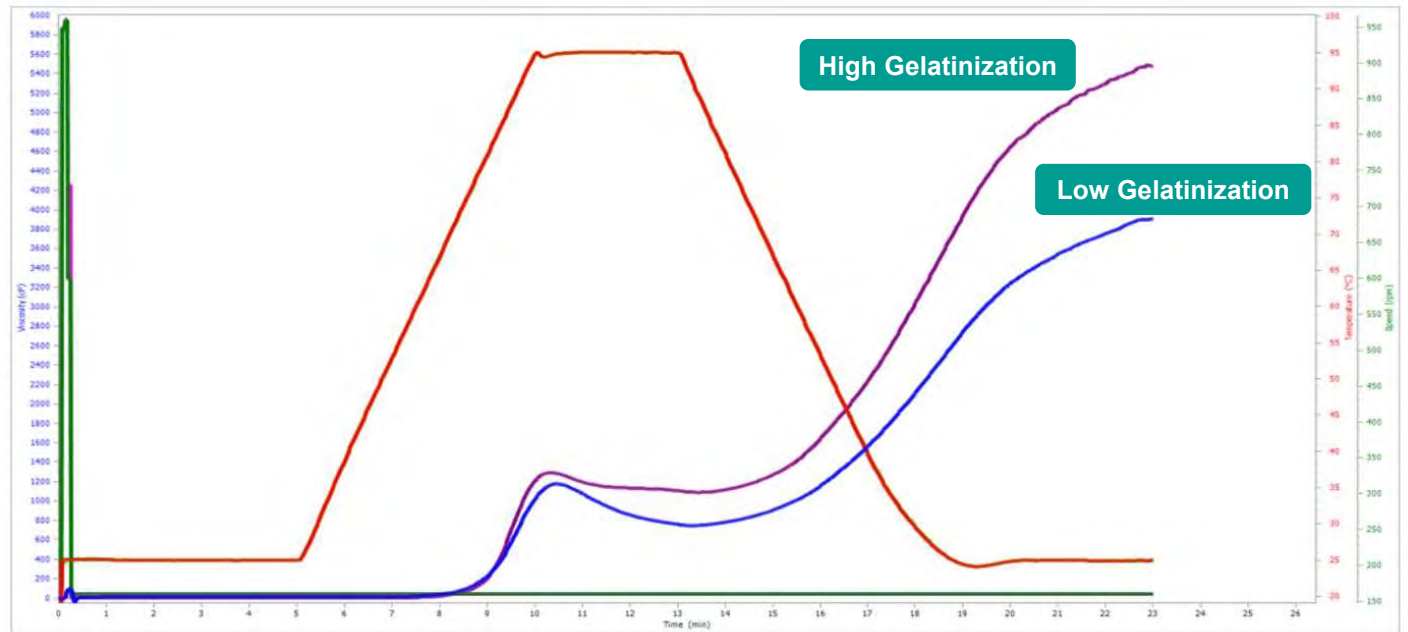
Samples 3 & 4
 More lime content

- ✓ Tortillas presented typical properties and same as control flour. They were rolled, compressed stretched without cracking or breaking.
- ✓ This test has proven that Prime Masa can be used to produce table tortillas

Tortilla Flour (White Maize US)



Granulation



RVA

Tortilla Chips Test

Some water quantity adjustments was required



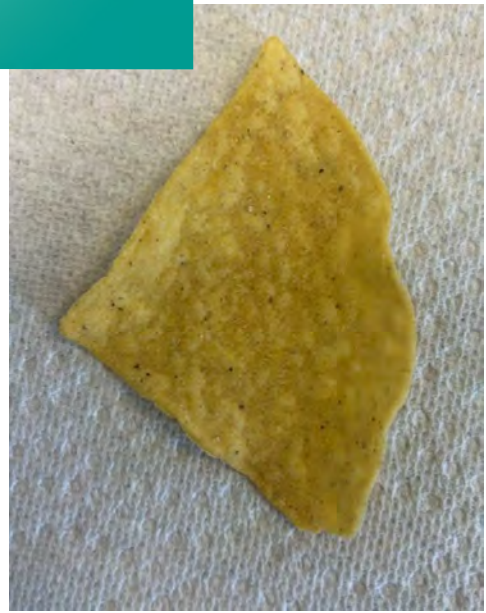
Forming (1000 kg/h)

Same performance and oil absorption



Baking & Frying

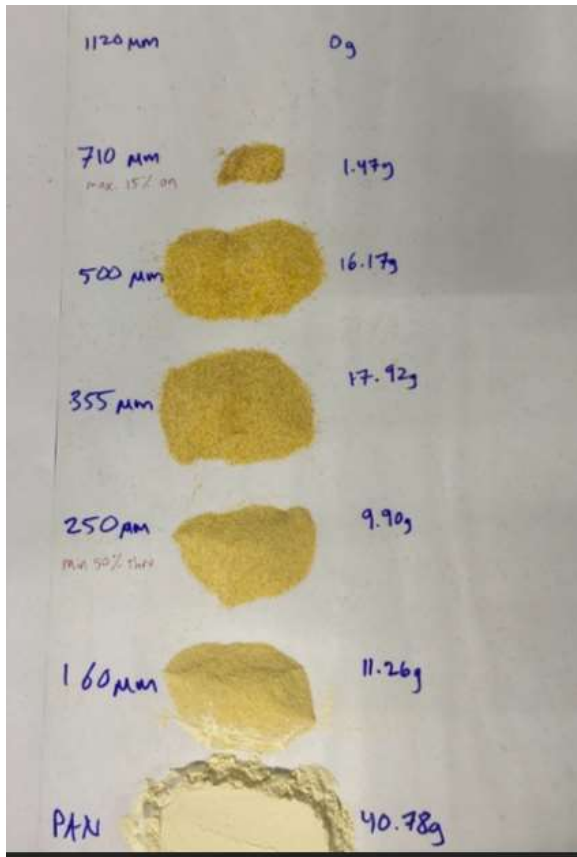
End product without any difference compare with control product



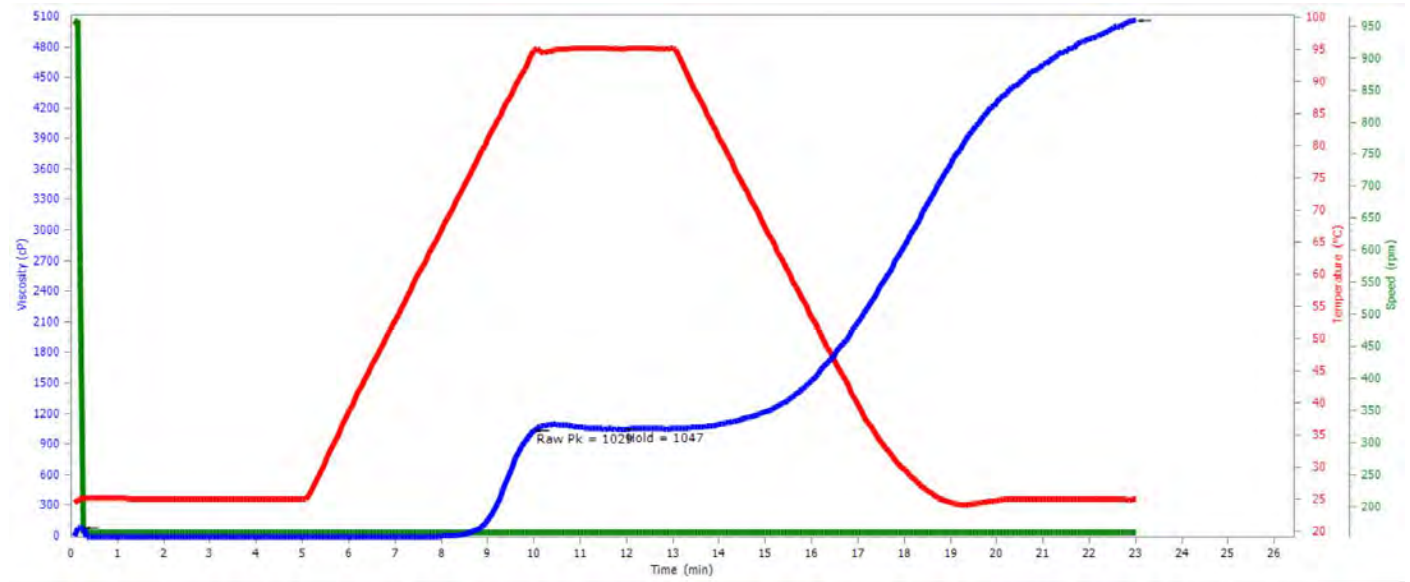
Final Product

Tortilla Chips Flour (Yellow Maize US)

Coarser granulation and less gelatinization degree compare with table tortilla flour



Granulation



RVA

Summary

- ✓ Prime Masa technology can be used to produce different types of Nixtamal flours.
- ✓ Tortillas and Tortilla Chips market is still growing worldwide...not only in America.
- ✓ Prime Masa Nixtamal is a sustainable process.
- ✓ The collaboration with customers and finished products makers have been the key factor to improve our technology.
- ✓ Our Food Application Center (FAC) is the perfect “playground” to test different raw materials, produce flours and validate their impact in the end products.

Innovations for a better world.

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