





# Innovative Solutions for Corn Tortilla and Corn Chips

Nicolas Charalampidis *R&D* 

#### Agenda

- Nixtamalization process
- Corn tortillas
- Corn chips
- Solutions







# **Nixtamalization Process**

#### **Nixtamalization**



- Origin: Mesoamerica
  - AZTECS
  - MAYA PEOPLE

#### NIXTLI: ASHES TAMALLI: DOUGH

Ash was the first source of calcium to cook corn

Main Objective: softening the pericarp and endosperm to allow for easier milling





**Nixtamalization process** 



#### Water

7

÷

Lime + Corn Kernels

Traditional Industrial

- Time
- Lime Concentration
- End Product







# **Tortilla Solutions**

# **Our Expertise**



**TECHNOLOGY CENTER** 

#### Rheology

- Amylogram test
- Mixingtest / Farinograph
- Dough test

- Application
- Tortilla test
- Texture analyser

53

Empiric testing

#### **Micro-Amylograph Test**

Viscosity measurements are useful to evaluate the quality and properties of corn flour

Controlled mixing of water and corn flour with the addition of heat provides the parameters to measure the viscosity properties

RVA / viscoamylograph Brabender.



**Types of Corn Flour** 





#### Coarse Milled Corn



Differences depend on:

- Temperature cooking
- Time cooking
- Lime concentration

STERNWYWIOL GRUPPE

### **Food Additive Effects**





Increased viscosity suggests corn flour with improver absorbs more water

STERNWYWIOL GRUPPE

# From Amylograph to Tortilla

Hydrocolloids and Enzymes on Corn Flour

Improves water absorption (< 4 %)</li>

- Increases yield kg tortilla / kg corn flour (2 %)
- Improves machinability



deutscheback

Together. Better Baking

# **Texture Analyser Test**

Corn flour: No Additives



#### Hydrocolloid and Enzyme Mix (2 %)



- Texture Analyser TA.TX plus
- TPA measures the dough's force to estimate the consistency of the dough

STERNWYWIOL GRUPPE

deutscheback

### **Texture Analyser**



Hydrocolloid and Enzyme Mix (2 %)



- Higher water absorption with the same (or better) consistency and dough structure
- It is possible to improve water absorption and machinability

STERNWYWIOL GRUPPE

deutscheback

## **Tortillas**









# **Tortilla Trials**

#### **Corn Flour No Additives**



#### Hydrocolloid and Enzyme Mix (2 %)



- With the Texture Analyser TA.TX plus, it is possible to measure the force and the extensibility of the tortilla
- The probe presses onto the tortilla until the breaking or ripping point is reached





## **Tortilla Test**





No Additives

#### Hydrocolloids and enzymes (2%)







#### Recipe



Coarse milled corn (100%)

65 - 70 % water absorption
75 - 85 °F dough temperature
8 - 20 min mixing time







### **Dough Machinability**

- For plastic or stainless-steel roller heads
- No warm or hot water needed
- Improved machinability













# **Solutions** Bleaching Agents



### Color

Adequate balance of emulsifiers and enzymes:

Increases "L" value (brightness)

Decreases "b" (yellow color)



# **Bleaching and Softening Agents**

deutscheback Together. Better Baking.

- Improve bright color
- Change the tortilla color
- Improve flexibility and softness
- Improve machinability
- Counteract dryness in tortillas

Force to tortilla breaks (texturometer test) 290 Reference. No 285 additives 280 275 g 270 265 260 TopBake 255 0 2 3 Days



## Solutions Preservatives

#### **Preservatives**



**TECHNOLOGY CENTER** 

- No changes in smell, taste, or appearance
- For a wide pH range (4 7 pH)
- No changes in production process
- Use of chemical compounds in accordance with legal requirements
- High quality standardized particle size and constant testing



#### deutscheback

#### Summary

- ✓ Tortillas
  - ✓ TopBake Flexy Corn
- ✓ Corn chips
  - ✓ TobBake T-CH
- ✓ Bleaching agents
  - ✓ TopBake Flexy Soft & Bright Corn
- Preservatives
  - ✓ TopBake Preserve Corn







Thank you very much for your attention Nicolas Charalampidis R&D

> ncharalampidis@sterningredients.com.mx cel. +525559092248