



Technical challenges and solutions for clean label tortilla

Roman Gradert

Head of R&D Baking Americas

Agenda

- Company introduction
- Chemical vs. Natural Ingredients
- Technical challenge
- Natural solutions
- Lipase & Amylase
- Inactivated yeast

Company introduction

 **STEM TECHNOLOGY CENTER**
Futuremaker



Group

- An owner-operated family company
- Headquarters in Hamburg, Germany
- 32 independent subsidiaries
- An international leader in the world of functional ingredients



R&D

- Development and production of customised ingredients and functional systems
- Own Stern-Technology Centers
- 150+ applications technologists



Global

- Worldwide networking through foreign branches
- Partner companies in all key markets
- International network of research facilities
- Intercultural teams

The Stern-Wywiol Gruppe specialists: From single ingredients to functional systems



The Stern-Wywiol Gruppe specialists: From single ingredients to functional systems



Baking Ingredients

- Baking solutions for bread and pastry goods
- Enzyme systems
- Concentrates
- Premixes
- Shelf-life
- Recipe development



From Flour to Final



From Flour to Final

Our Chain of Competences



Milling & Analysis



Steady Flour Performance



Research & Development



Enzyme Systems

Baking Ingredients



Bread & Rolls



Pastry Goods

Bakery Ingredients

Enzyme solutions

Flour Additives

Chemical vs. Natural Ingredients

[lexomh sjgqliq nqepmkvihnrw evi\$g tsvrxjsvxs vqpewC

- Iq ypwjri w>\$

Q srs\$ \$hkp}givniw
WWP
HEXIQ



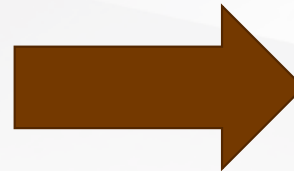
IFixivq eglmrefnpx} erh\$
weji twsgiww js {

Wxstmrk vixskvehexrs sj
wævgl q spigypiw

Wsjxerh\$ja |nfa\$svape\$sv
prk wlipjpi erh\$mk1
uyepx} wærehvhw

- Hsykl gsrhmnsriw

PG }wximi
Wshmyq q ixefmwpjxi



Ikssh\$pxir\$izipstq irx

Wihygi\$g mnrk xq i

Wikyev\$erh\$ym\$svq wleti
sjxsvape

[1 } wlsyph { i wievgl jsvgpier pefipC\$

- Tvsgiwwm twsziq irxw
- Pm q mih ezenefm sjiq ypmjw
- Uyepm m twsziq irx
- Gsw\$wezmk
- Pefipjwirhp}
- Irzmsrq irxepvixigmsr
- Mrszextsr

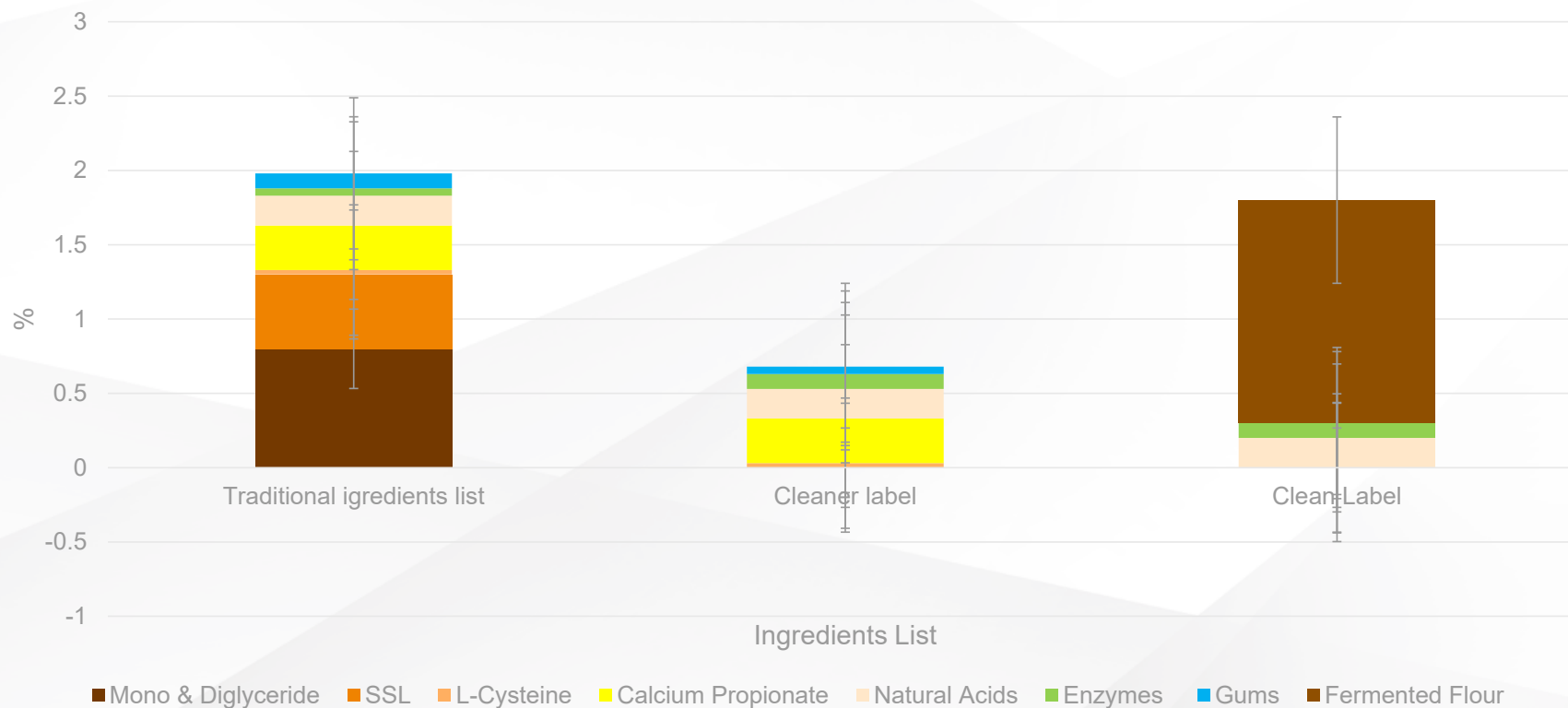


Clean Label Tortilla

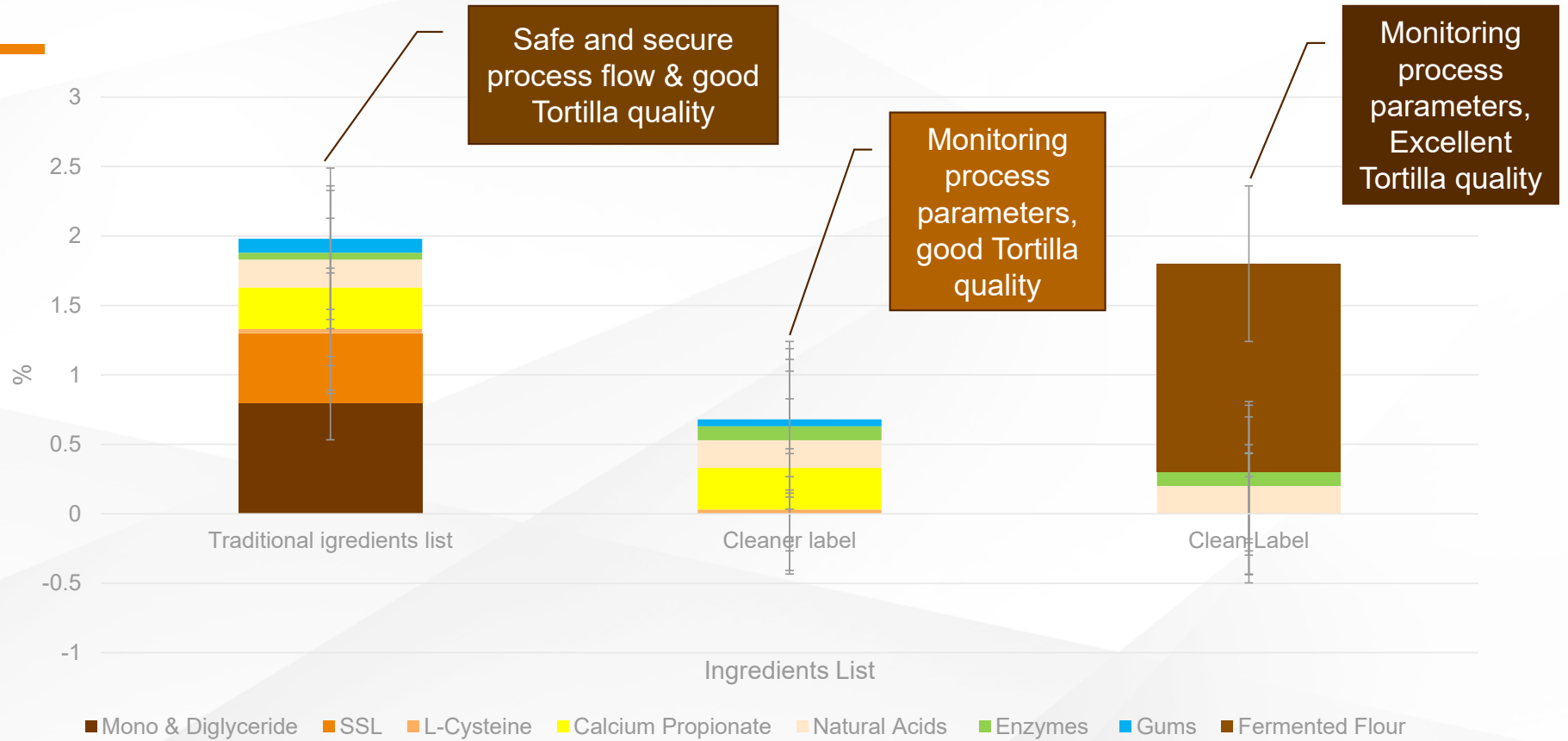
Technical challenge

How to guarantee the process flow and tortilla quality

Średnie zawartości składników w chlebie

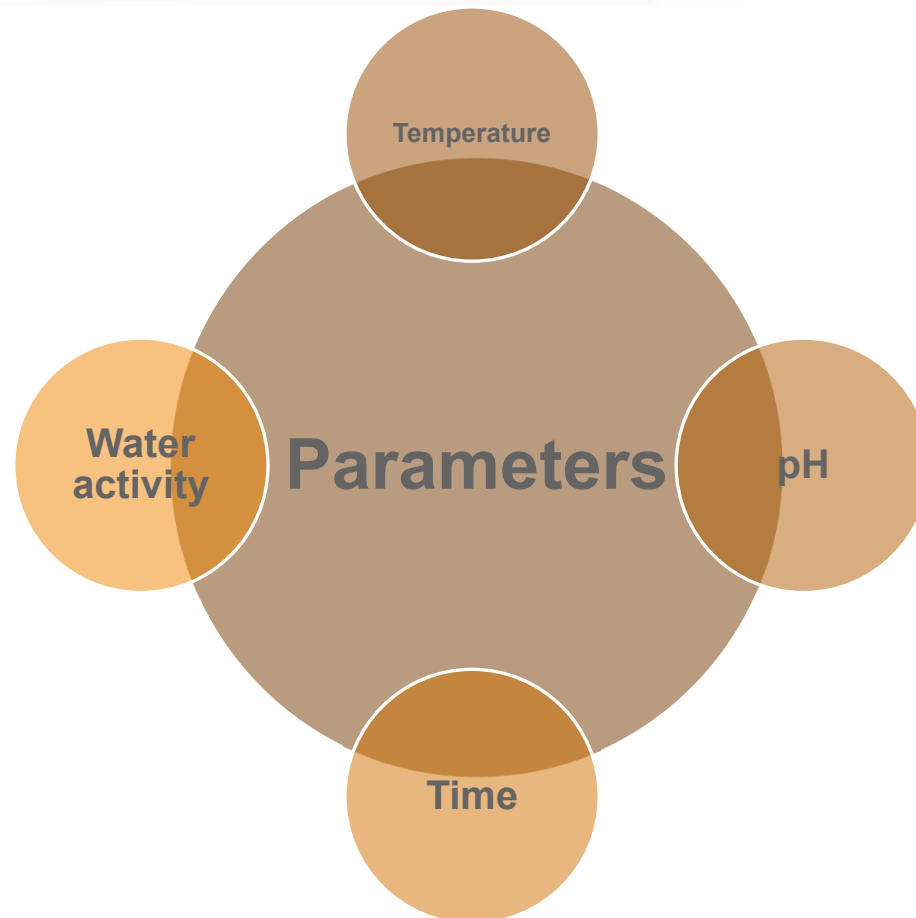


Ingredients List



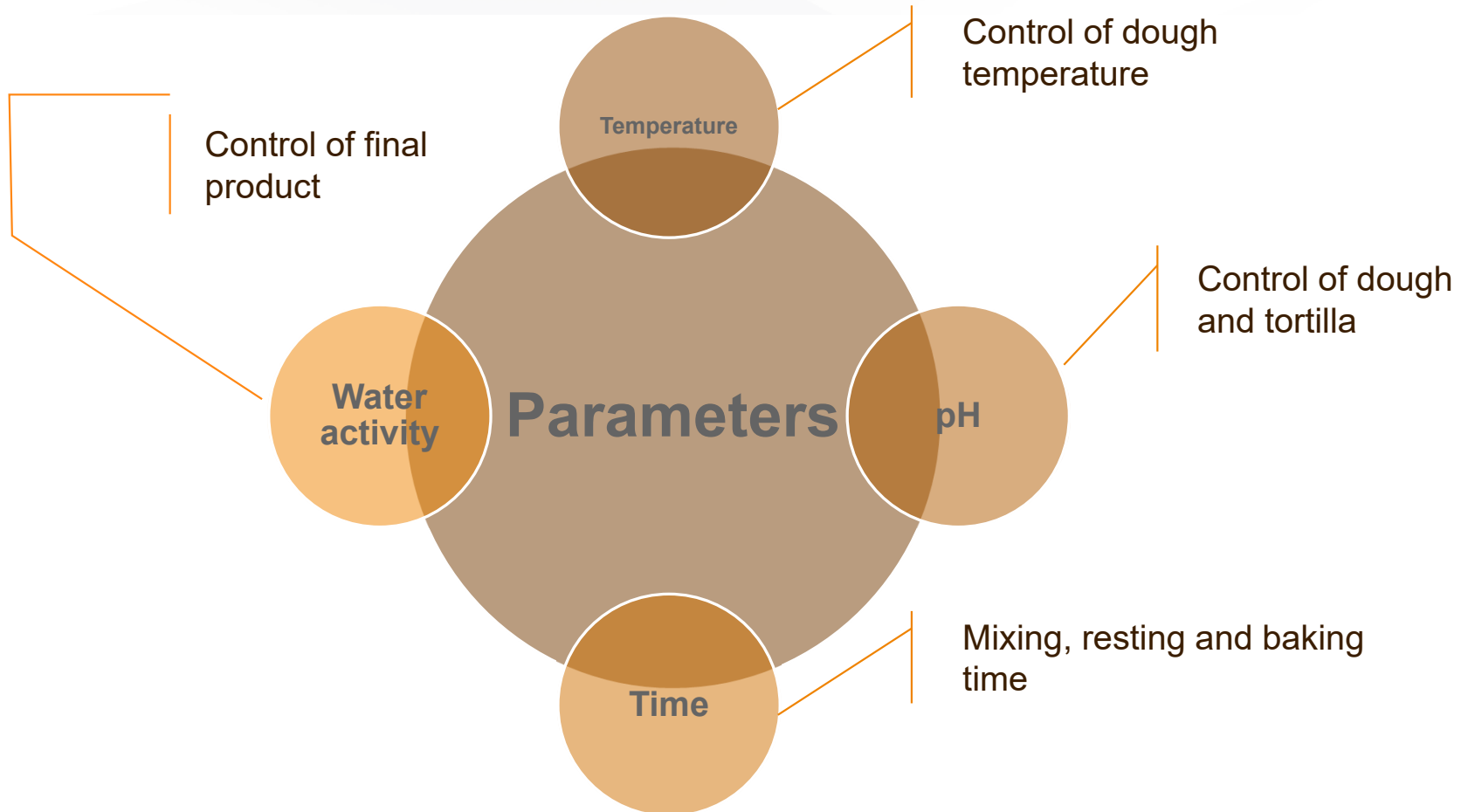
Monitoring process parameters

Temperature, pH, Water activity, Time



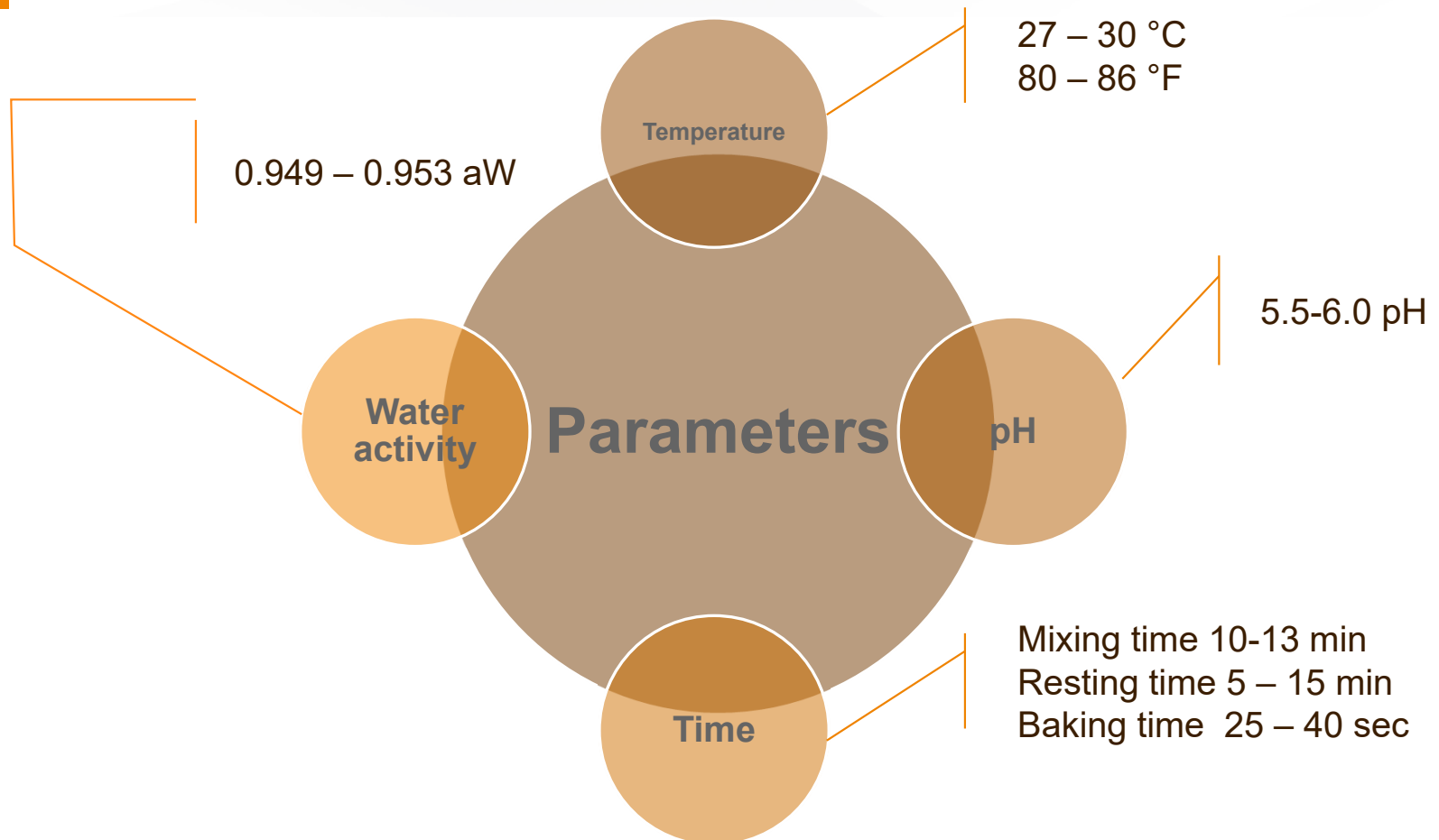
Monitoring process parameters

Js v g p i e r e f i p w s p y n s r w



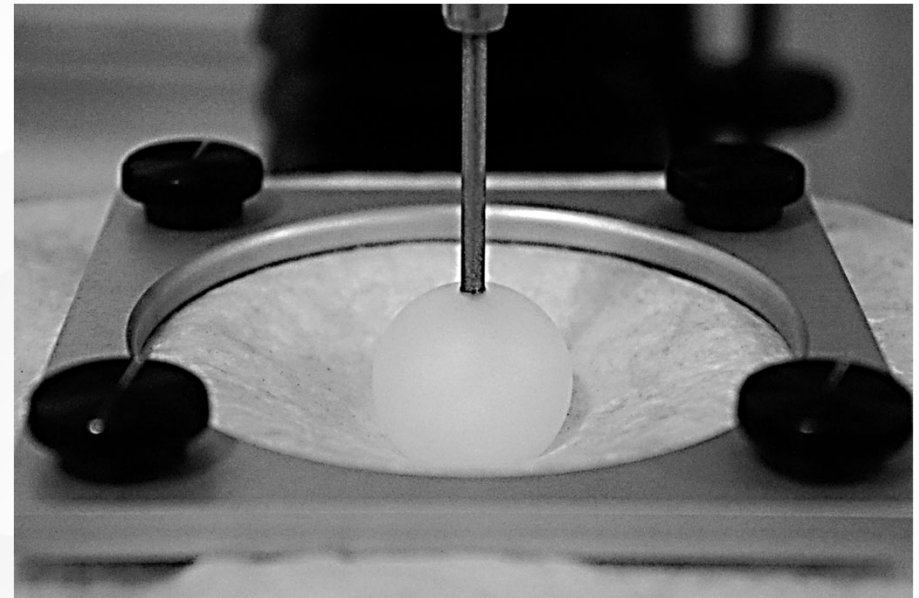
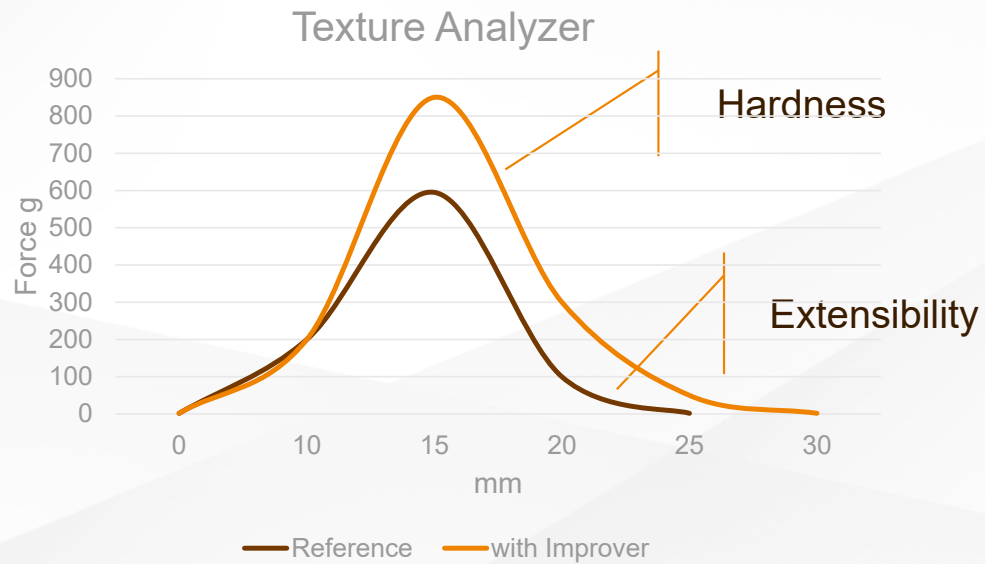
Monitoring process parameters

Vigsq q irhexsrw



Monitoring Tortilla quality

Xi | xyvi Erep } ~iv

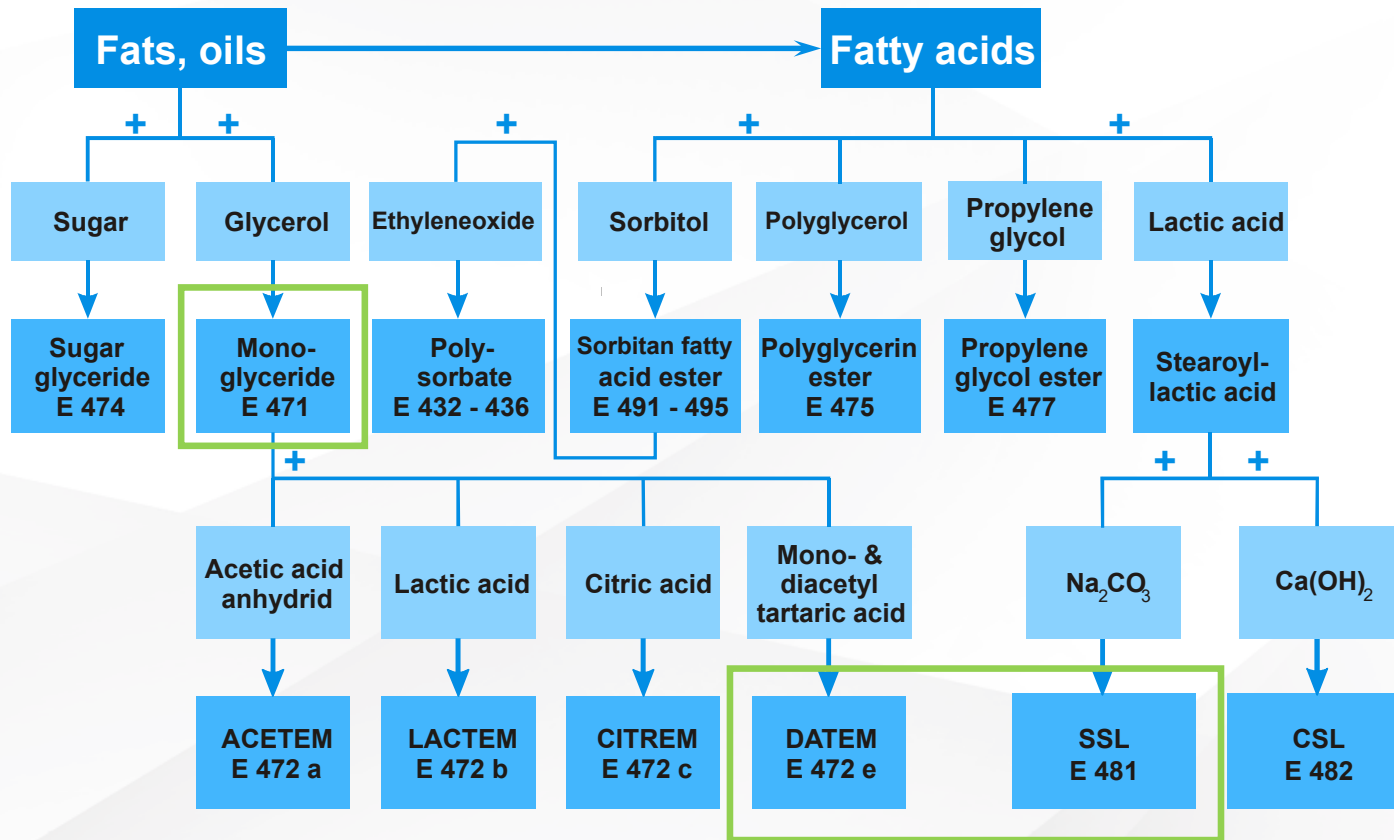


Natural solutions

How nature helps us

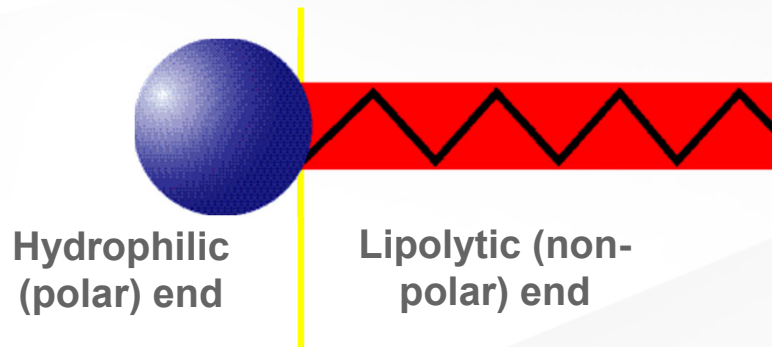
Emulsifiers

Origen

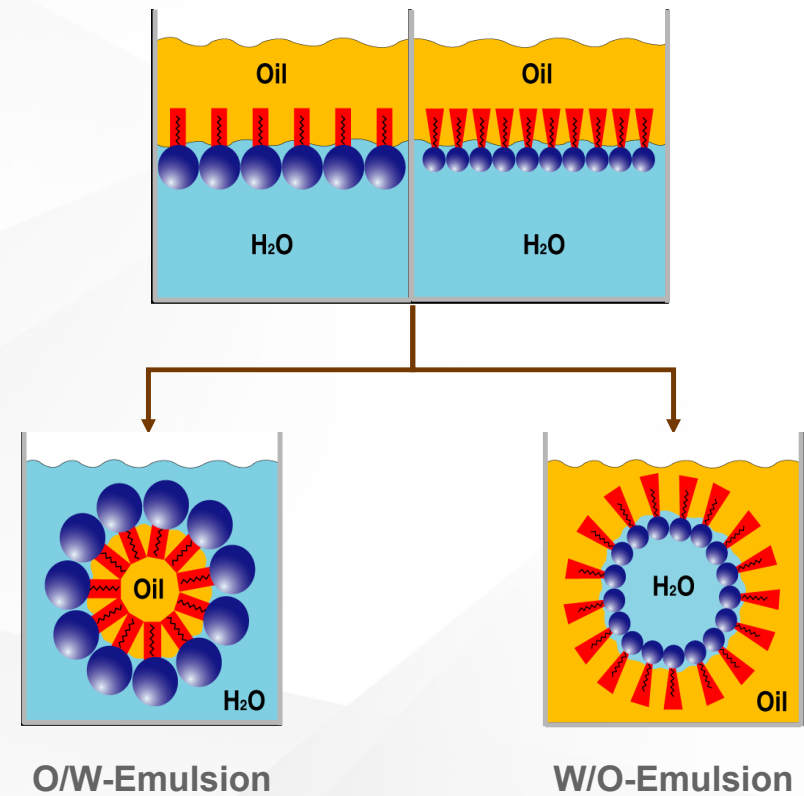


Emulsifiers

Function and stability



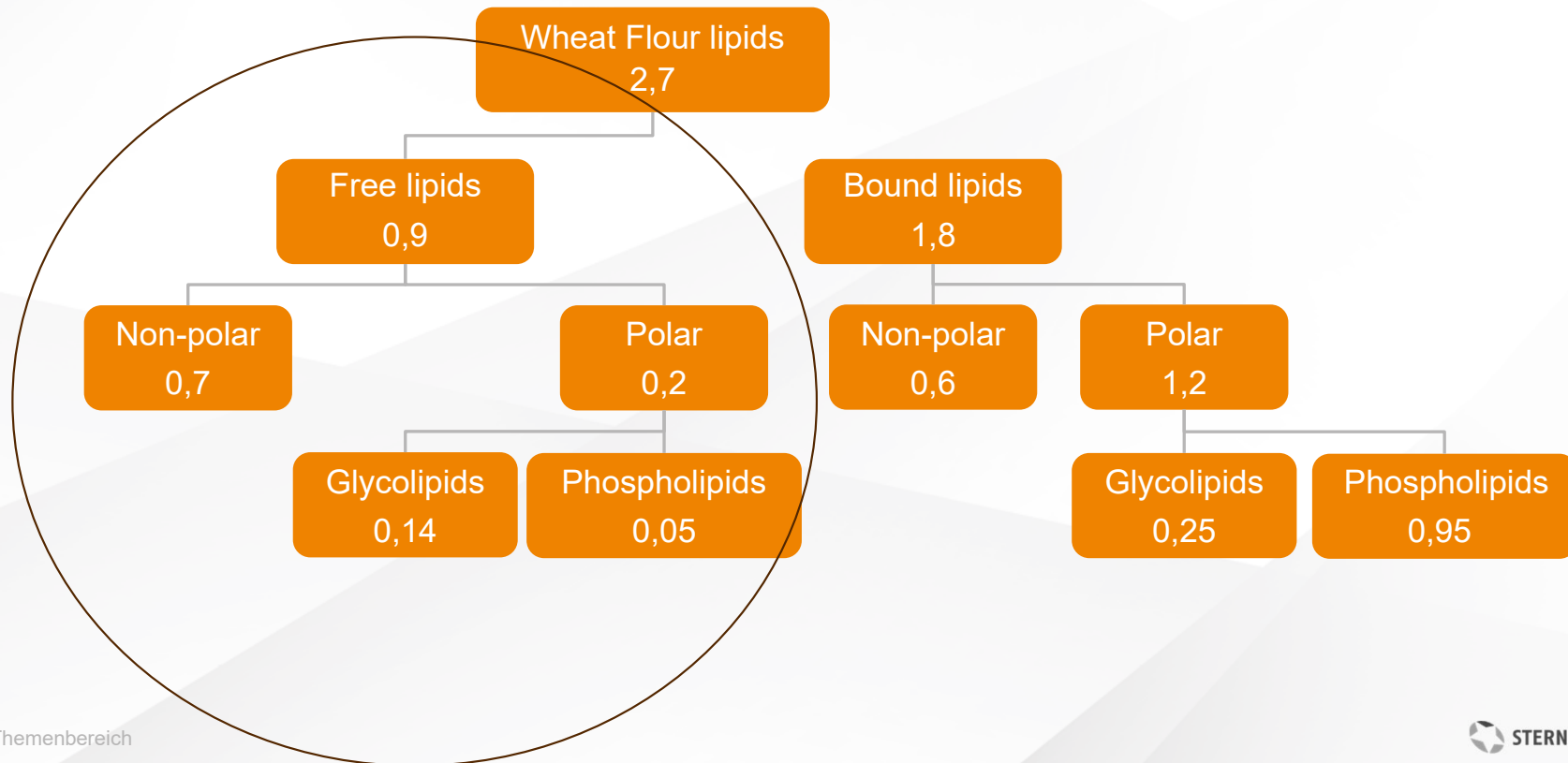
- Amphiphilic compounds also known as surfactants.
- Droplet size / Energy input
- Viscosity of the outer phase
- Ratio and density of the two phases



Lipase & Amylase

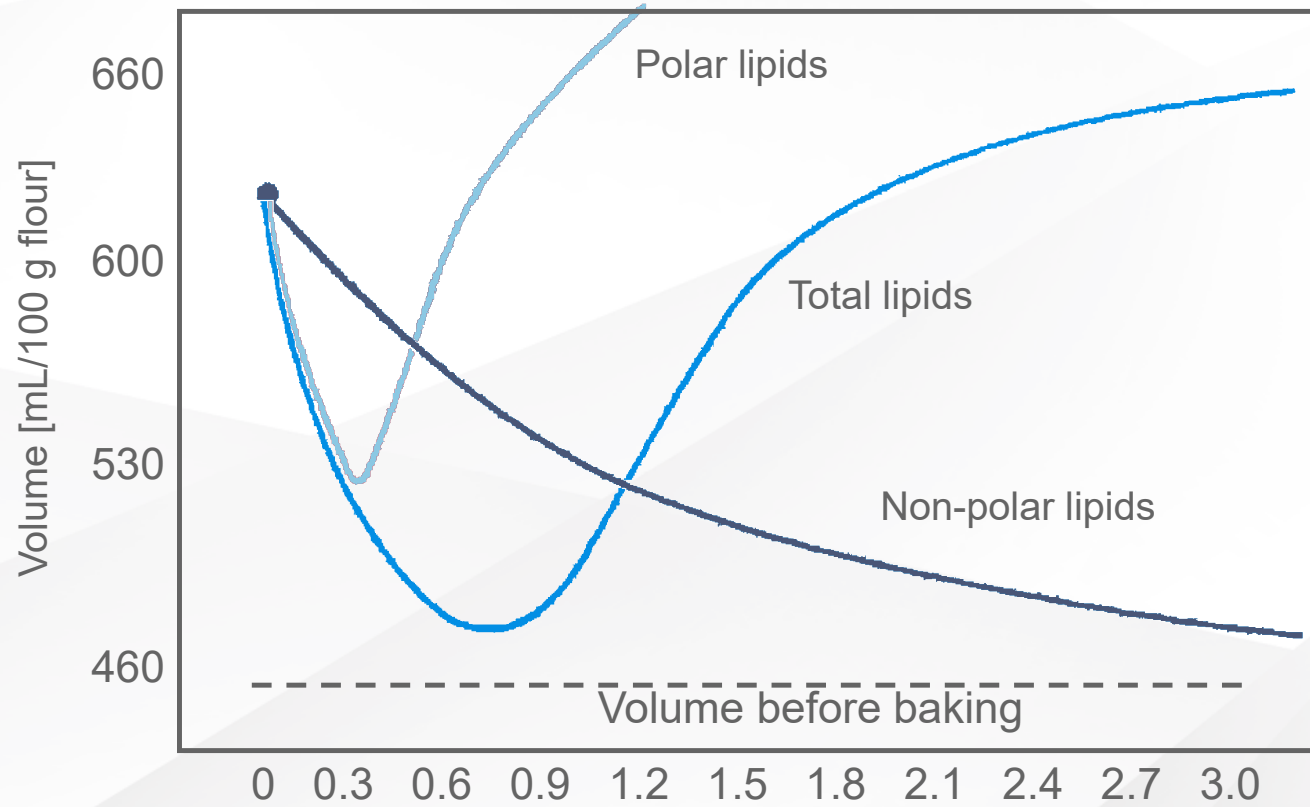
The perfect replacement for emulsifiers

Lipase Substrate



Lipase

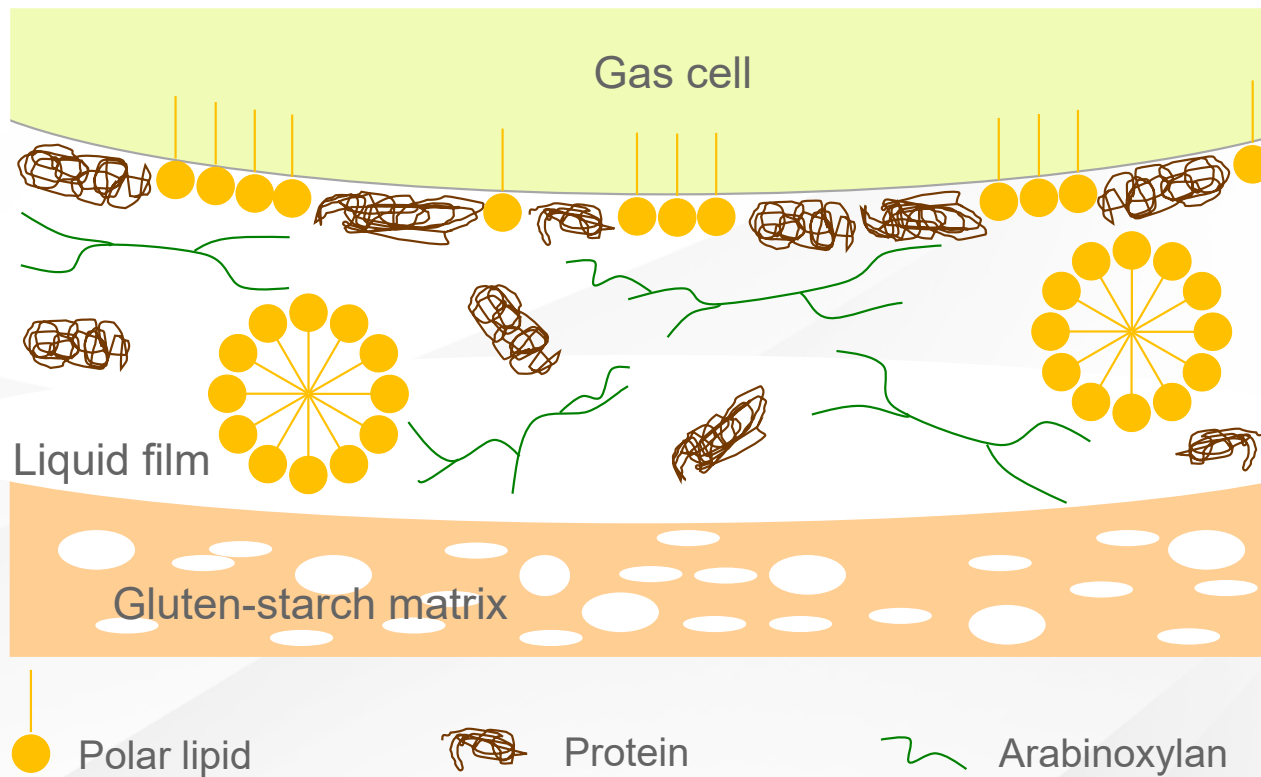
Influence of tortilla



Modif. from MacRitchie & Gras, 1973

Lipidas

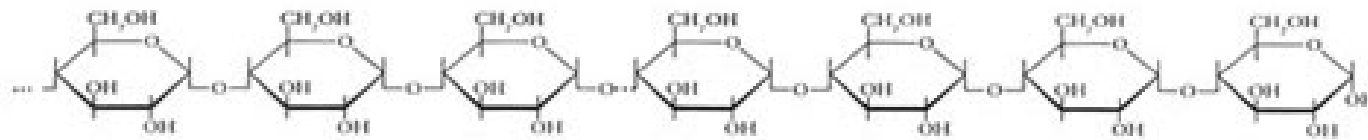
Stabilization of dough characteristics



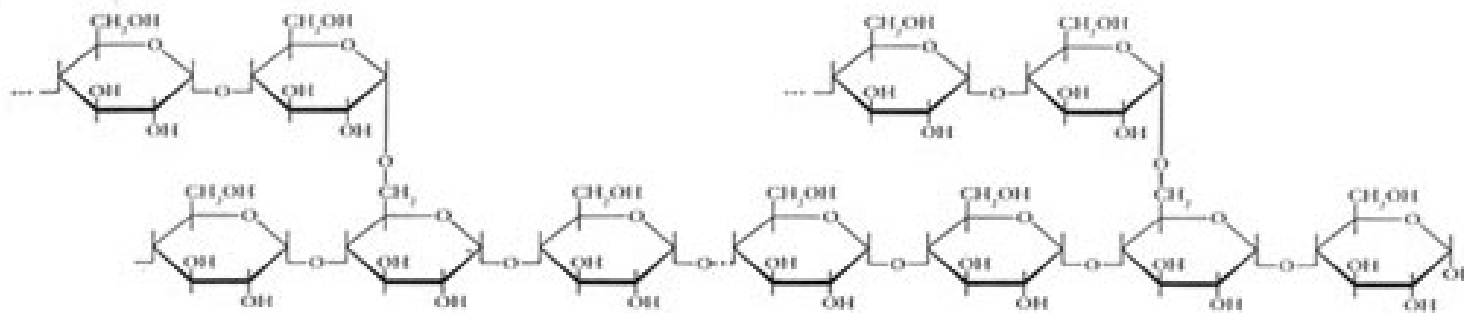
Modif. from Sroan and MacRitchie, 2009

Amylase

Maltogenic Amylase



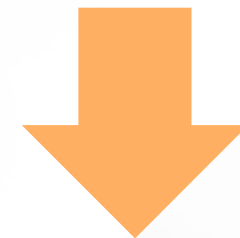
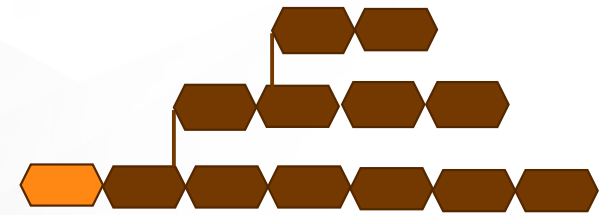
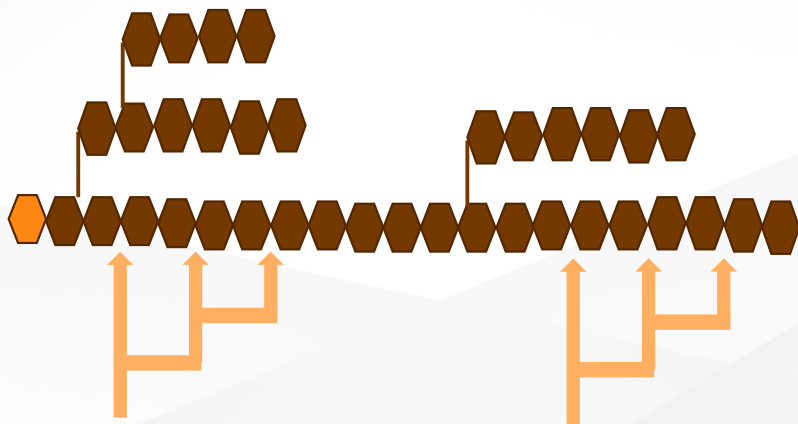
Amylose



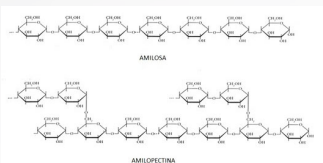
Amylopectine

Substrate for Amylase

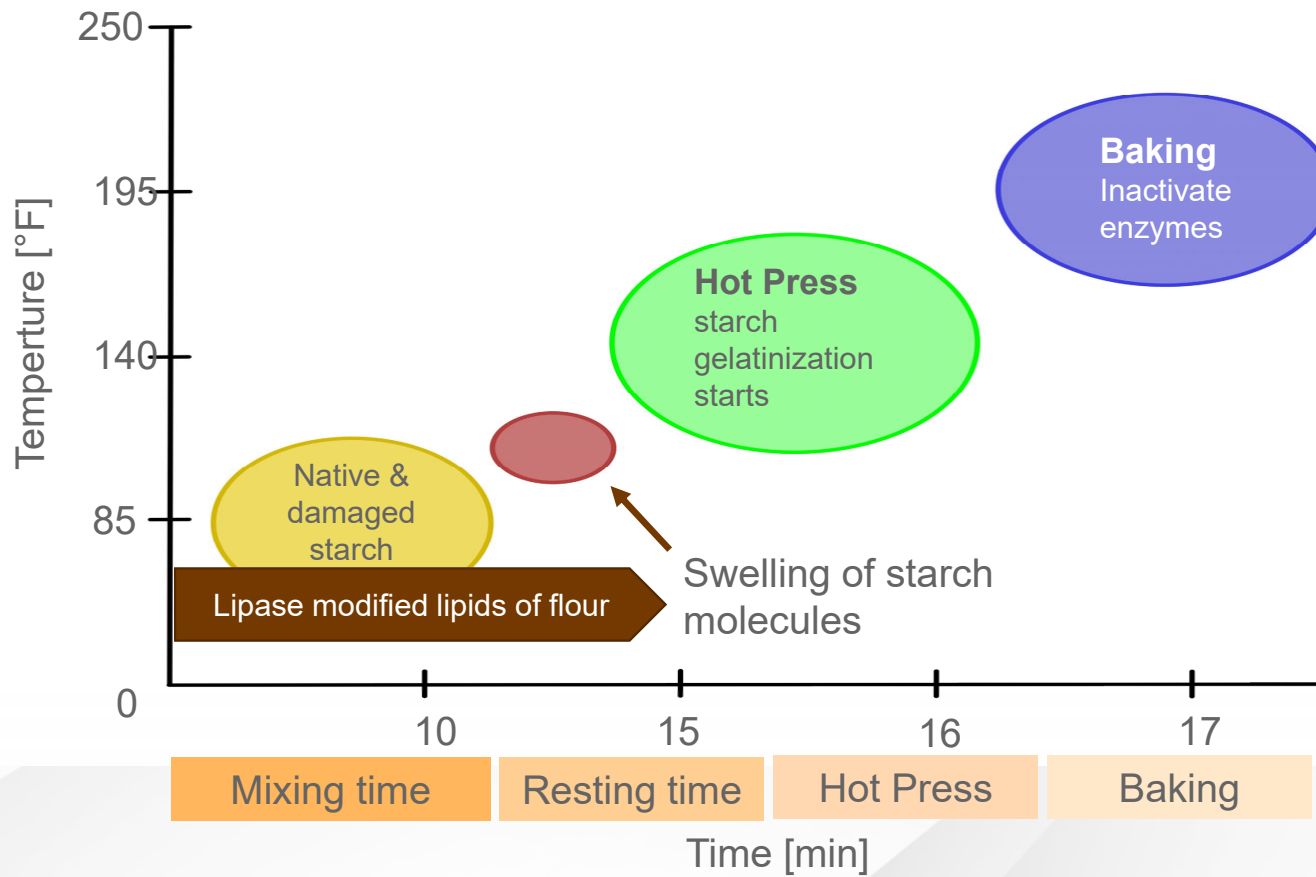
Maltogenic Amylase



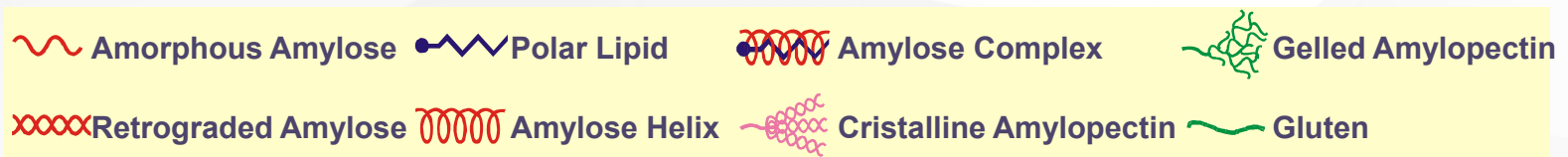
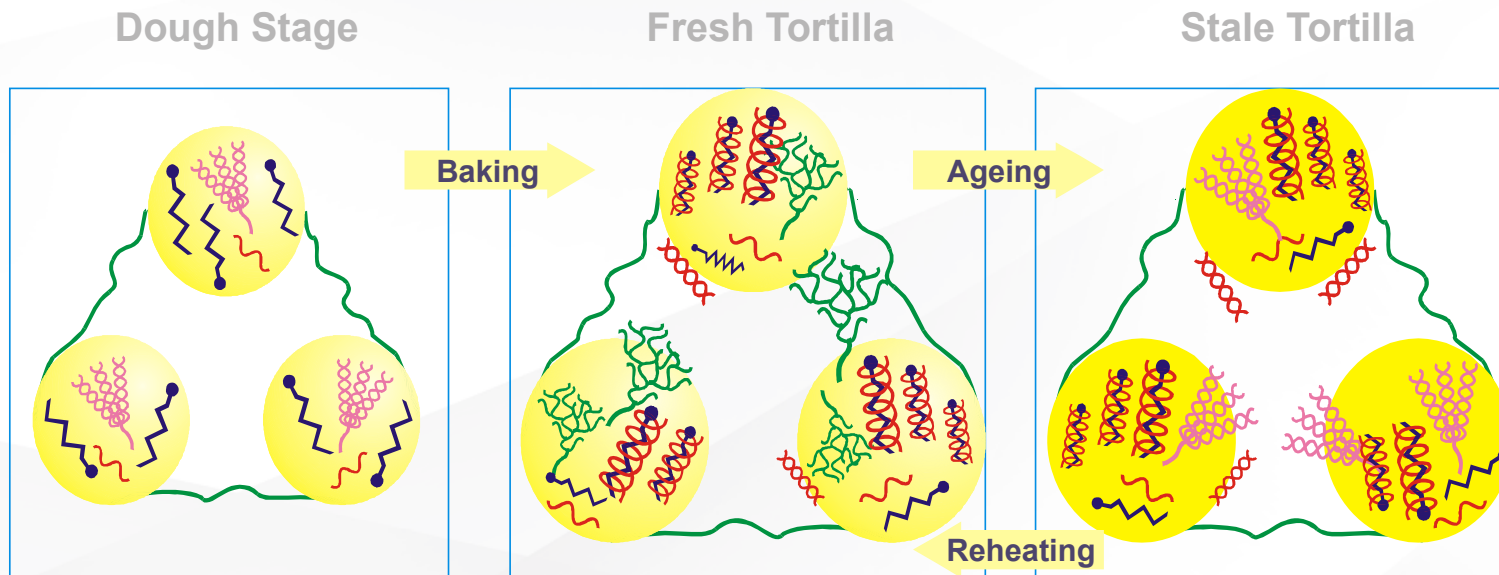
Cuts two units of glucose to maltose and change the structure of the amylopectin to reduce the cristalisation of emorph starch in baking products



Amylase & Lipase In Tortilla Process



Model for Tortilla Staling

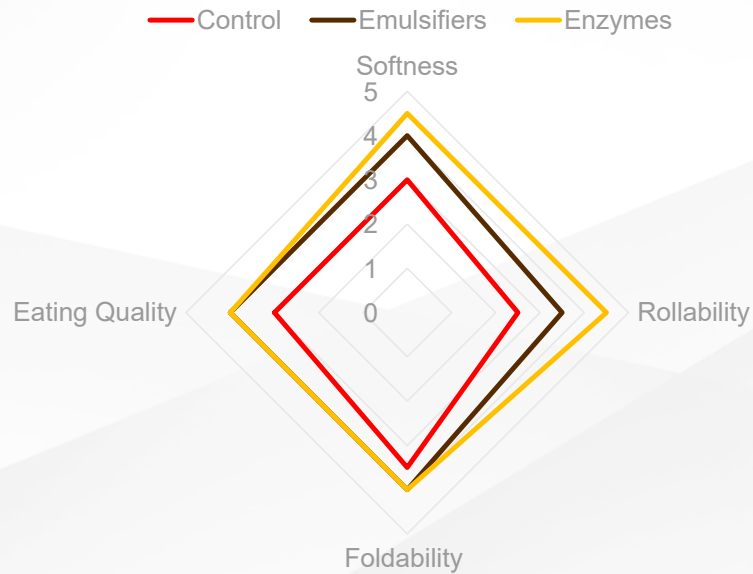


Modified from Zobel & Kulp, 1996

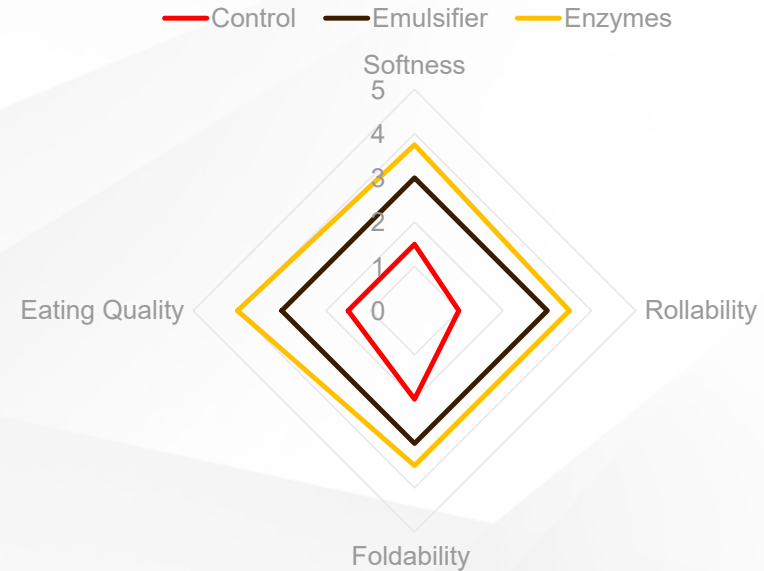
Tortilla

Sensory panel analysis

Fresh Tortilla



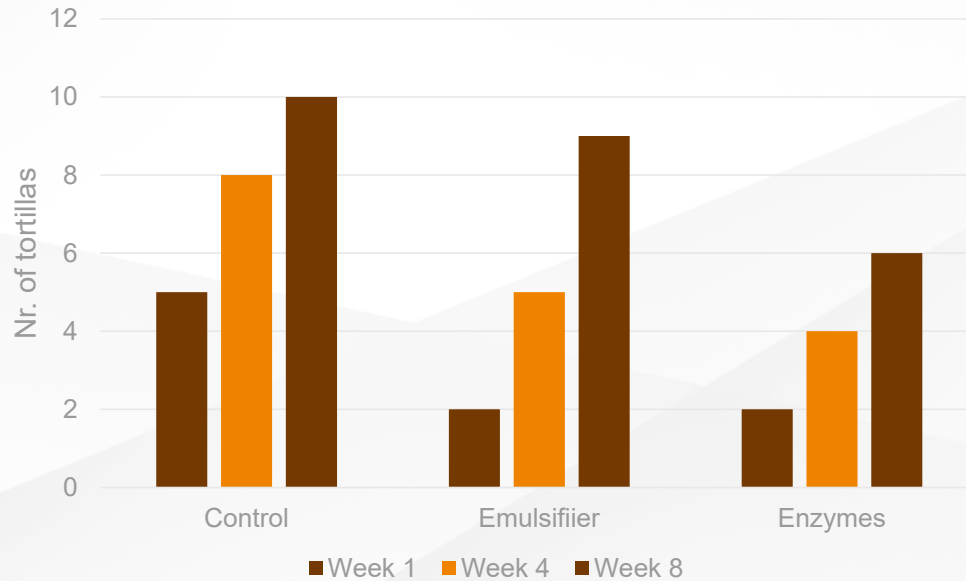
After 4 weeks Tortilla



Ingredients

In the storage period

Zippering



Tortilla without treatment



Clean label solution with Enzymes

Trials are tested with 10kg weight on the tortilla packages over the storage time

Glucoamylase

Brown spots



Control

40ppm

60ppm

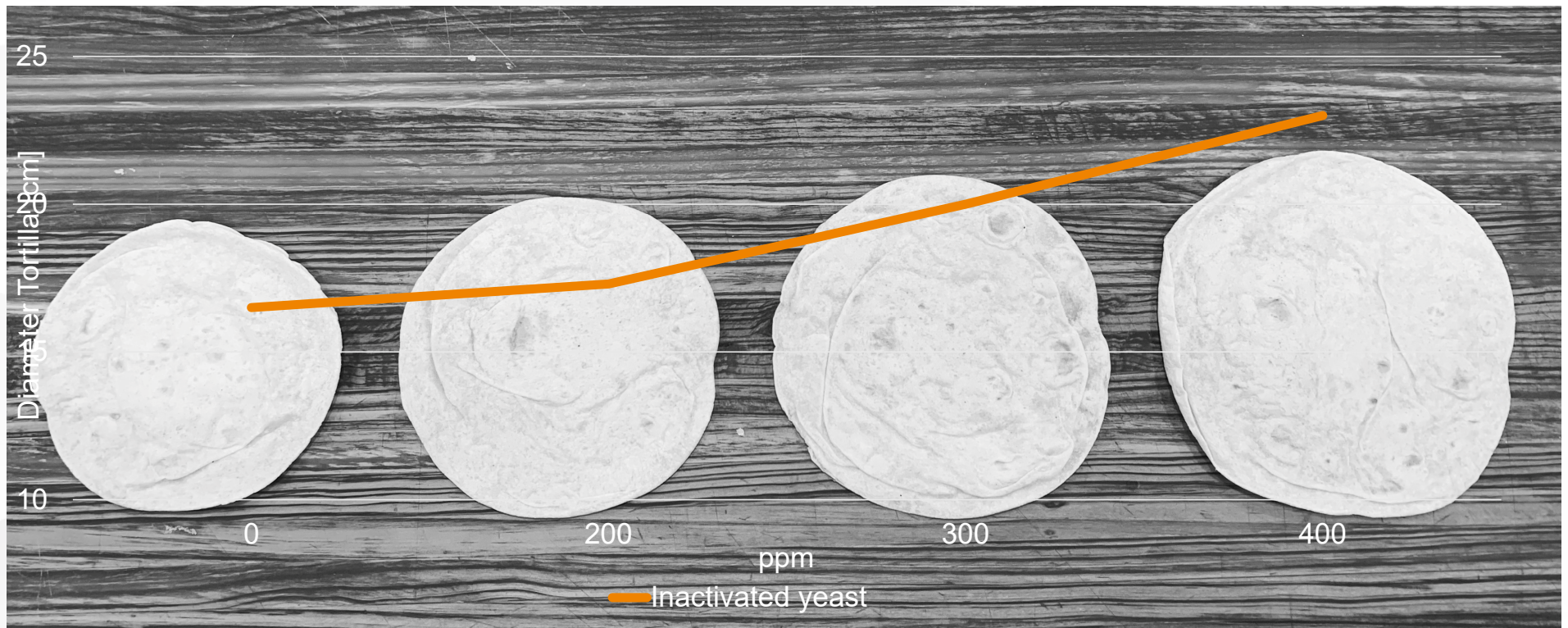
1% Sugar

Glucoamylase

Inactivated yeast

Dough and tortilla conditioner

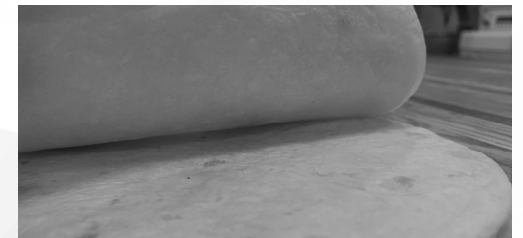
Tortilla with inactivated yeast



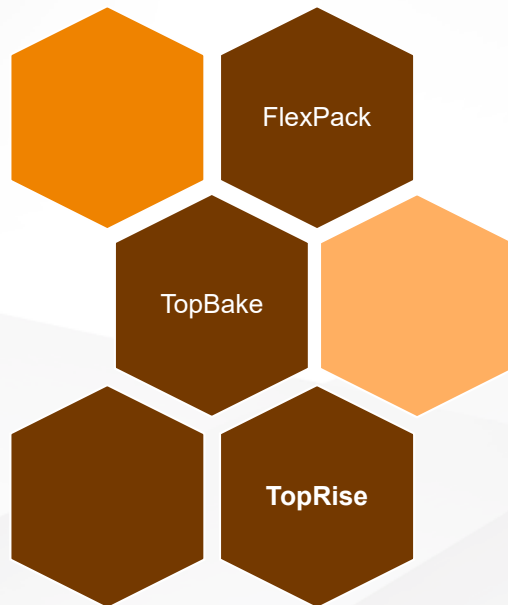
FlexPack

Solutions for tortillas

- Clean label solution for flour tortillas
- Long shelf life
- No zippering/ sticking
- Best eating quality
- Declaration
 - **FlexPack**
Pro, Clean, Country Style, Rustic & Fat-Free
8%
 - **TopBake Flexy**
Soft, Soft & Clean
2%



DeutscheBack Tortilla tool-box



Customer-oriented
solutions



Summary

Clean Label

- ✓ New Enzyme technology
- ✓ Controlled process parameters
- ✓ Natural flavor
- ✓ Long softness and shelf life tortilla



Thank you very much for your attention

Roman Gradert

Head of R&D Baking Americas

rgradert@sterningredients.com.mx

cel. +5215514732080