KPM

INTERNATIONAL ASSOCIATION OF OPERATIVE MILLERS

Flour control: Looking beyond proteins!

Lena Bosc-Bierne

Food, Products and Applications Manager

Brief history of Flour Quality control

Prehistory

The Pioneers

The Legacy

Since 6000 bc
Stone milling

1879
1st Roller Mill

1916
AACC

1955
ICC

PROTEIN

1883
Kjeldahl

1926
Alveo
1928
Farino

1953
Rheo

1950
Falling
Number

1970
Glutomatic

1980
NIR

1980
RVA

1990
SD4

2005
Mixolab

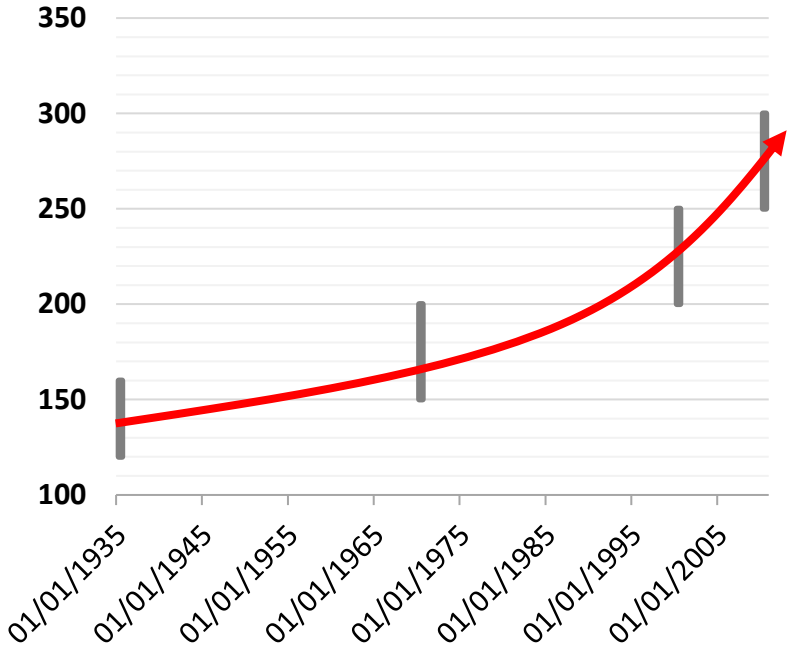
So, MOST of t
T OLS & PROTO LS
we still use each da were
DEV ELOPED and AD PTED
to the quality of w ats
GROWN IN
du
1ST HALF tury

STARCH/ENZYME

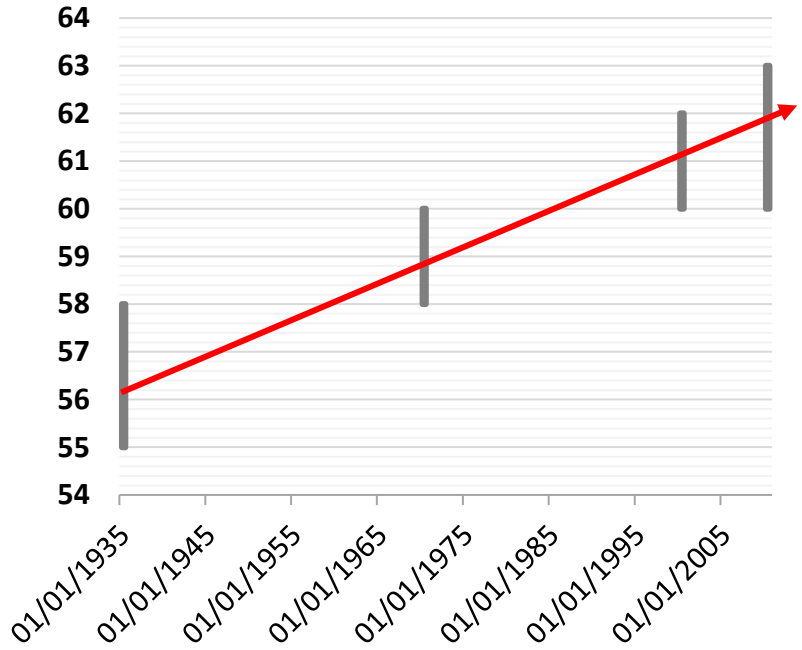
1930
Amylo

Does it still make sense to use legacy technology?

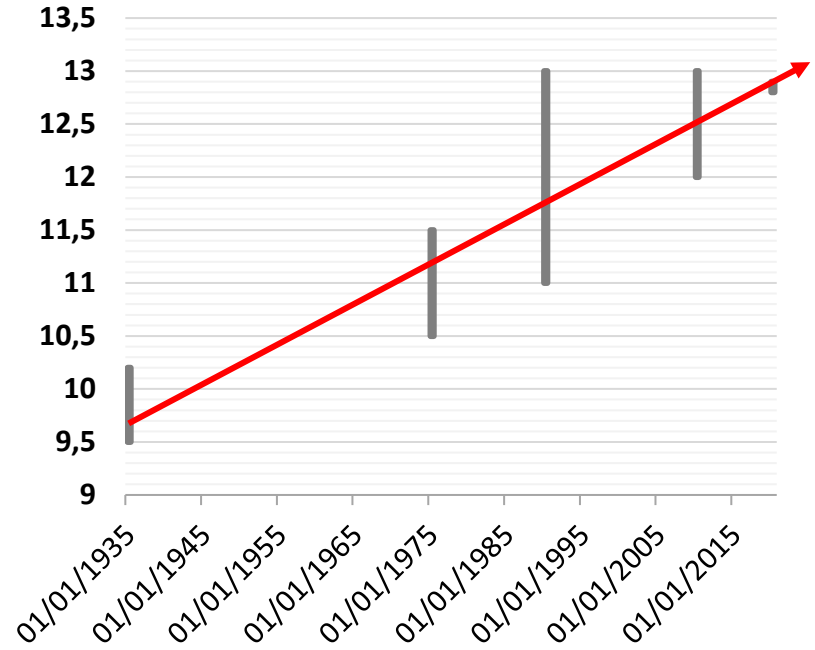
Evolution of Wheat flour
Alveo-W value (France)



Evolution of Wheat flour
Water absorption (USA)



Evolution of Wheat flour
Protein content (Germany)

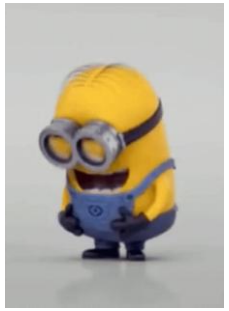


Between 1935 and today

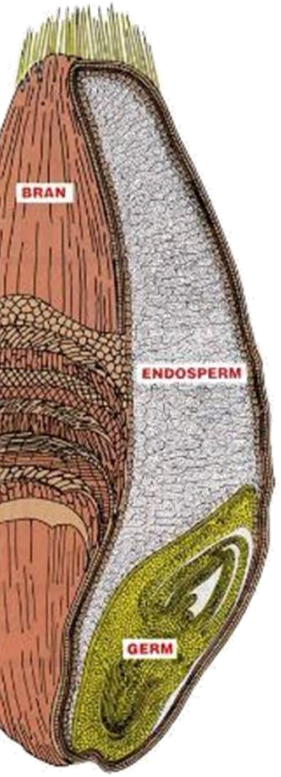
- The strength (W) have **more than doubled**
- Water absorption **gained 6%** (huge!)
- Protein content **increased 3%** (also huge!)

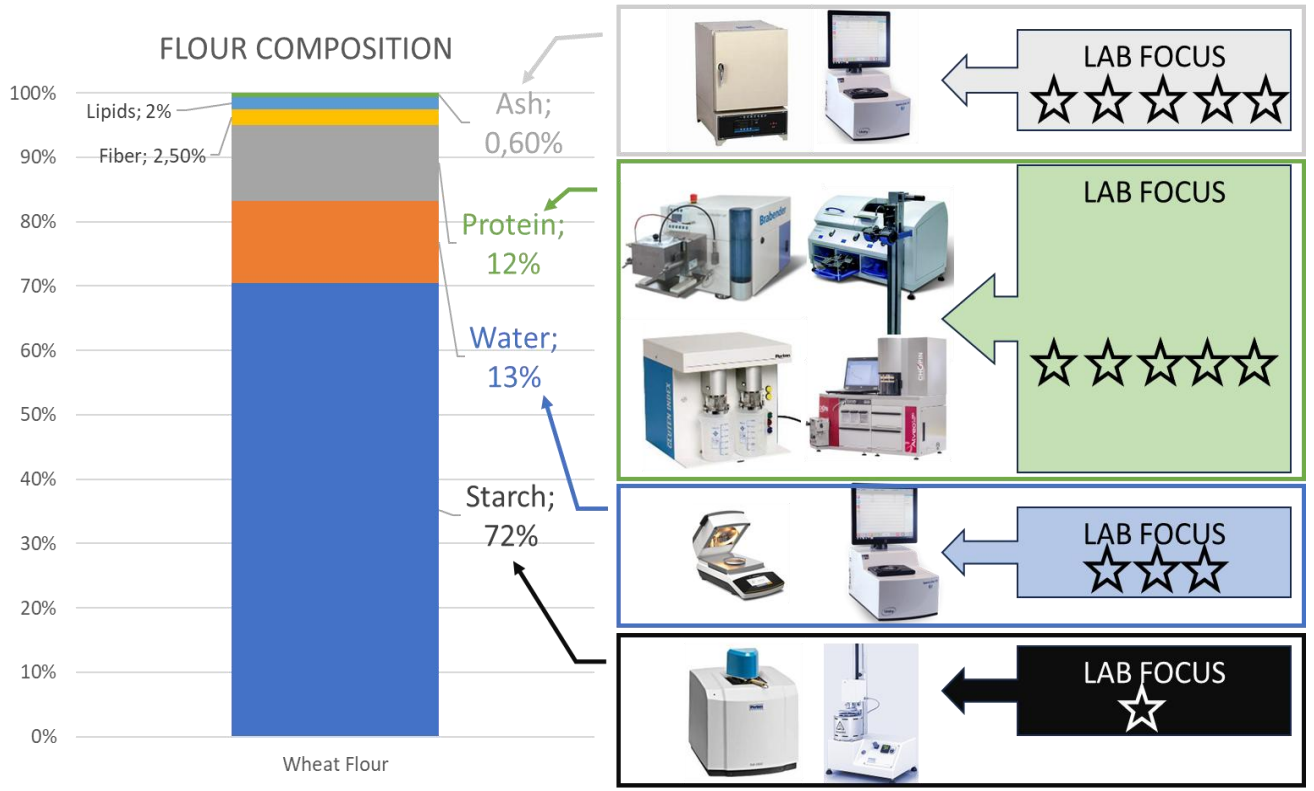
Question:

Are we still doing baking test the same way we were doing in 1930?



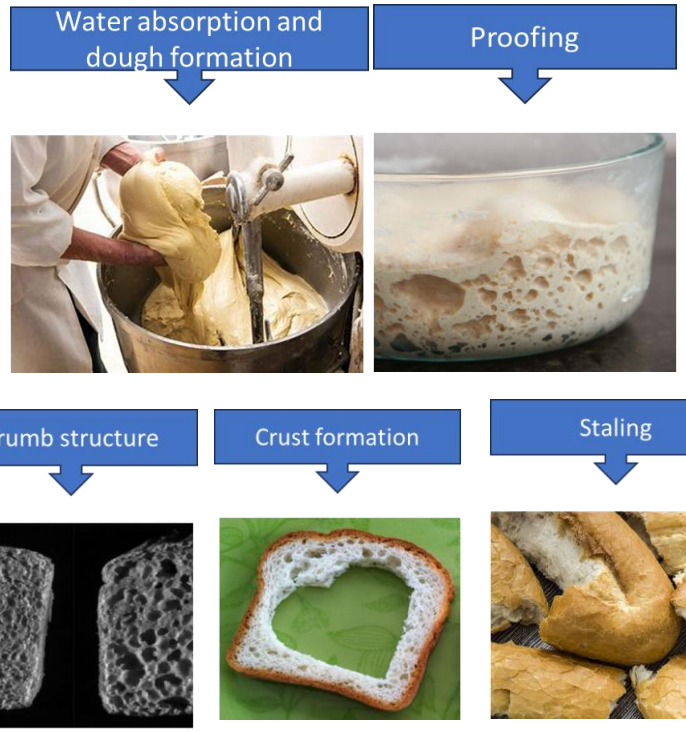
Yet, today in our Labs…





70-75% of the Raw Material « FLOUR » is Mostly **OUT OF CONTROL!**

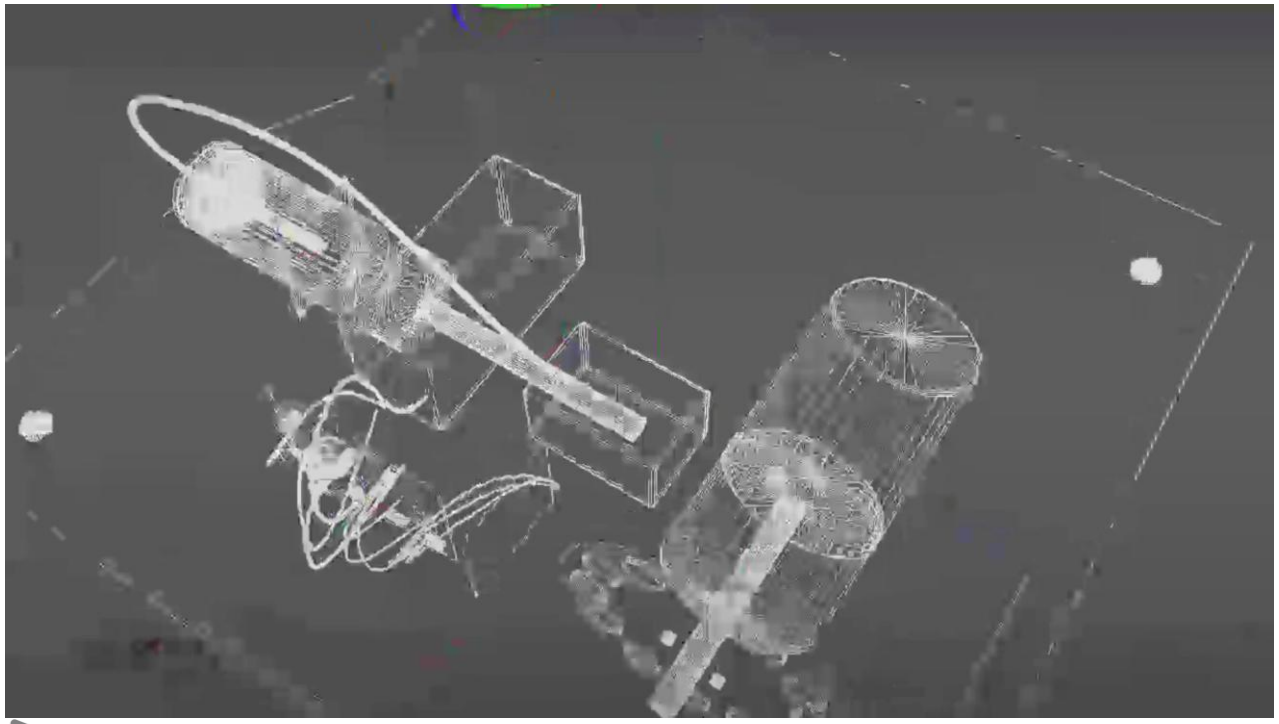
- **STARCH IS FUNCTIONAL**…It Impacts Dough properties…and product appearance

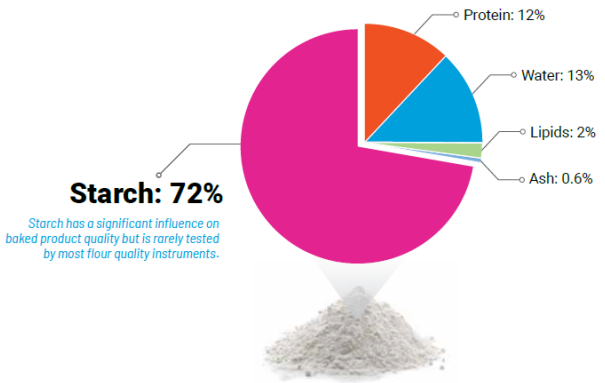


Control 100% of your flour with the Mixolab!

The Mixolab provides UNIQUE information about flour

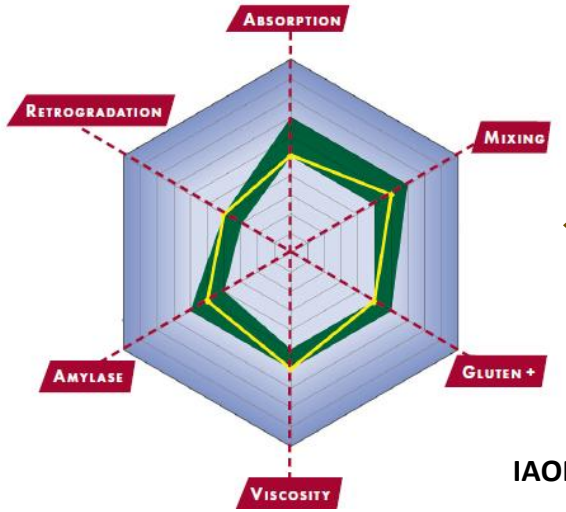
The MIXOLAB assesses the evolution of the consistency of dough during mixing and temperatura changes.





Provides information about proteins AND starch

In a DOUGH system (not a batter)

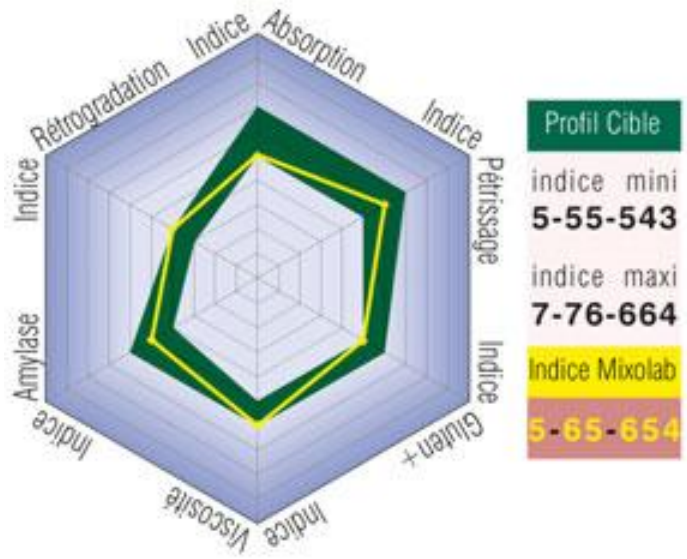


SIMPLE and COMPLETE information: ideal for QC

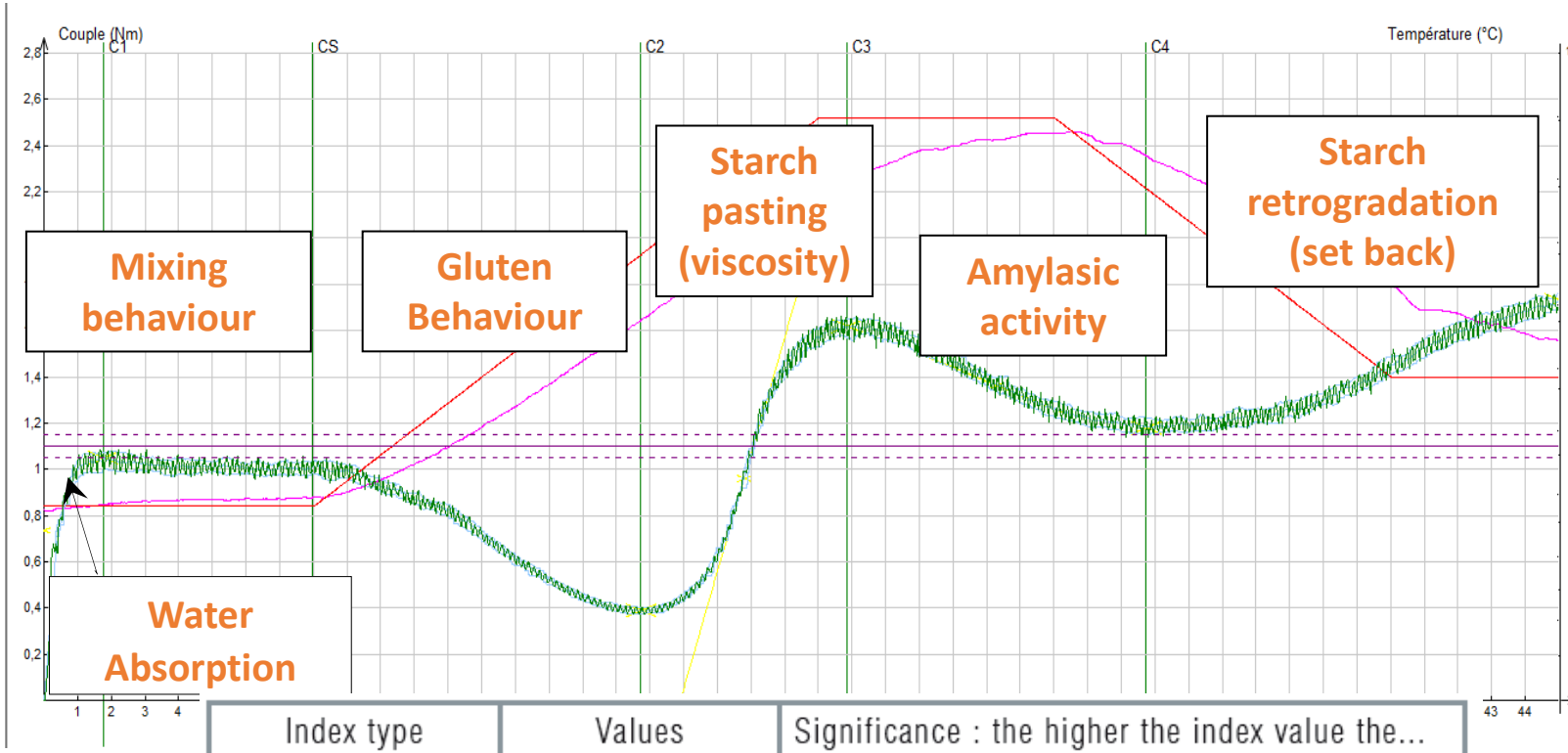
Convert this information into an easy-to-read fingerprint of the flour thanks to the profiler!

The Profiler is a « Curve Translator »

It converts the standard graph into a very comprehensive quality control tool :



Create your own target !

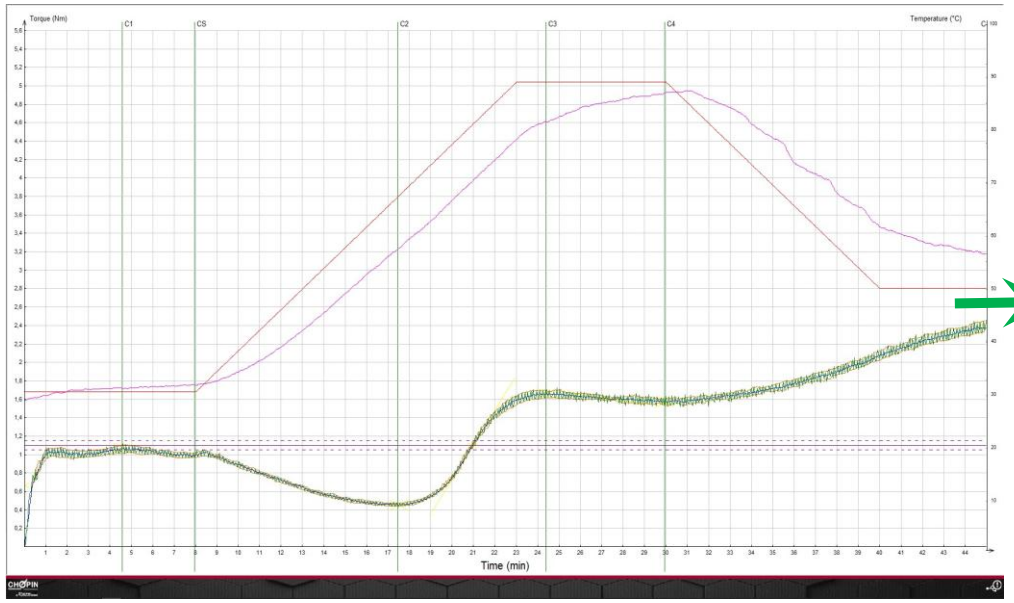


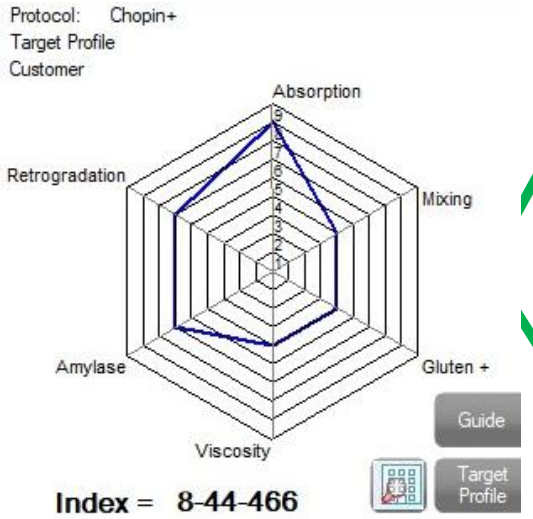
Index type	Values	Significance : the higher the index value the...
ABSORPTION	From 0 to 9	... more the flour absorbs water
MIXING		... more the flour is stable at kneading
GLUTEN+		... more the gluten resists heat
VISCOSITY		... greater the dough's viscosity when heated
AMYLASE		... weaker the amylase activity
RETROGRADATION		... shorter the cooked product's shelf life will be

HOW DOES TARGET PROFILER WORK?

Flour target profiles represent the acceptability of a specific process, for making a specific product.

1/ ANALYSIS AND TRANSLATION

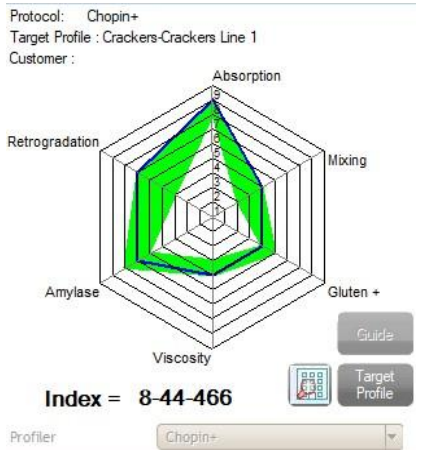




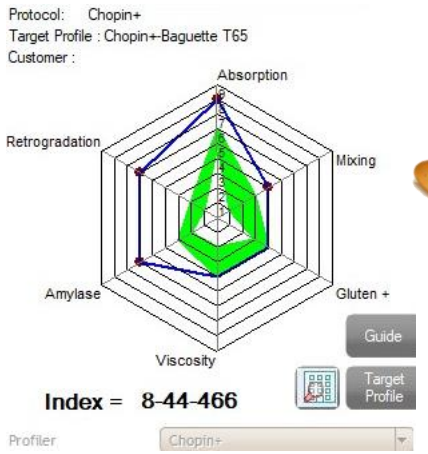
2/ COMPARISON

3/ DECISION

INSIDE

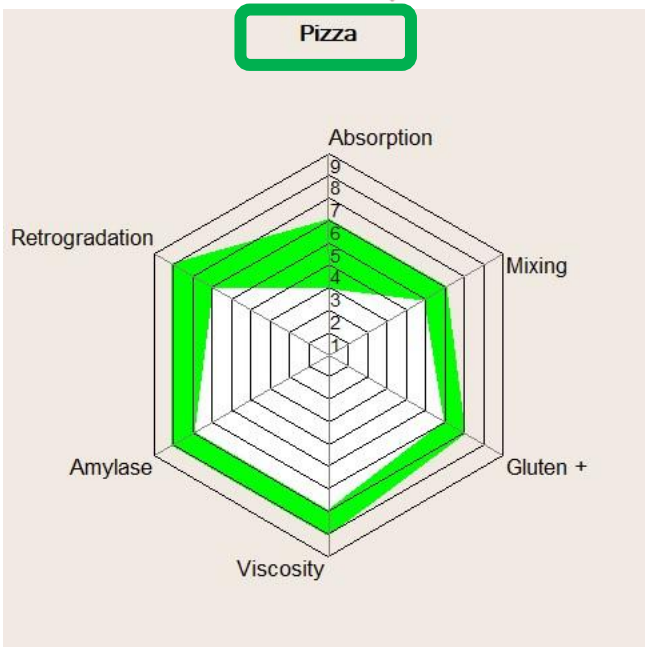


OUTSIDE

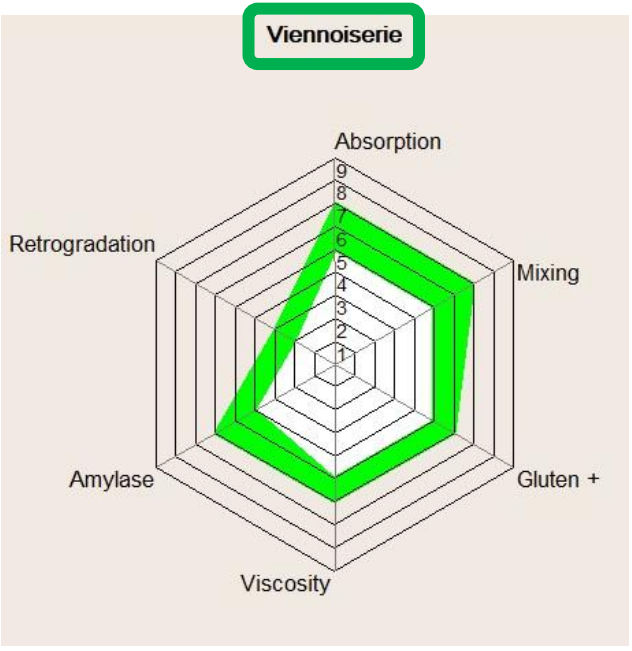


DIFFERENT PRODUCTS = DIFFERENT PROFILES

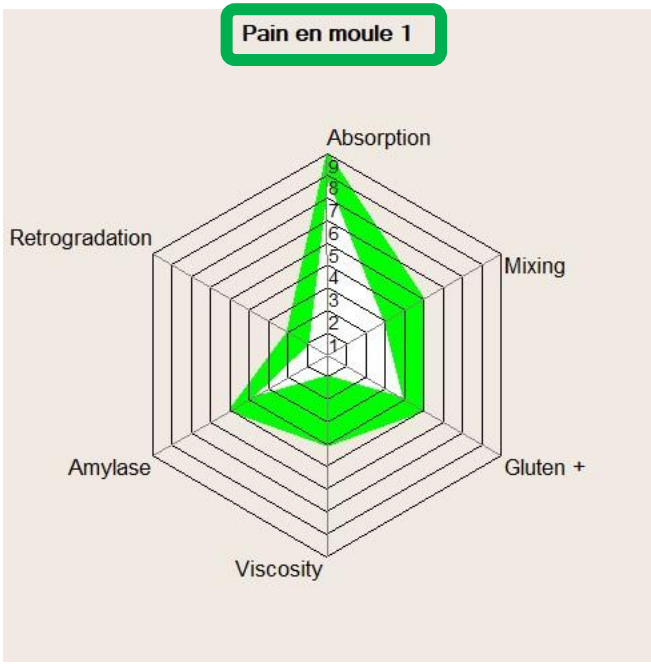
Pizza



Viennoiserie

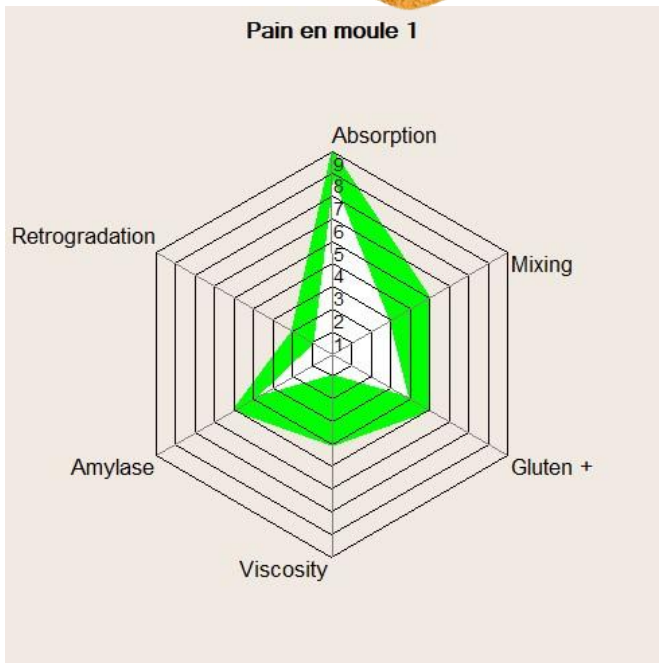


Pain en moule 1

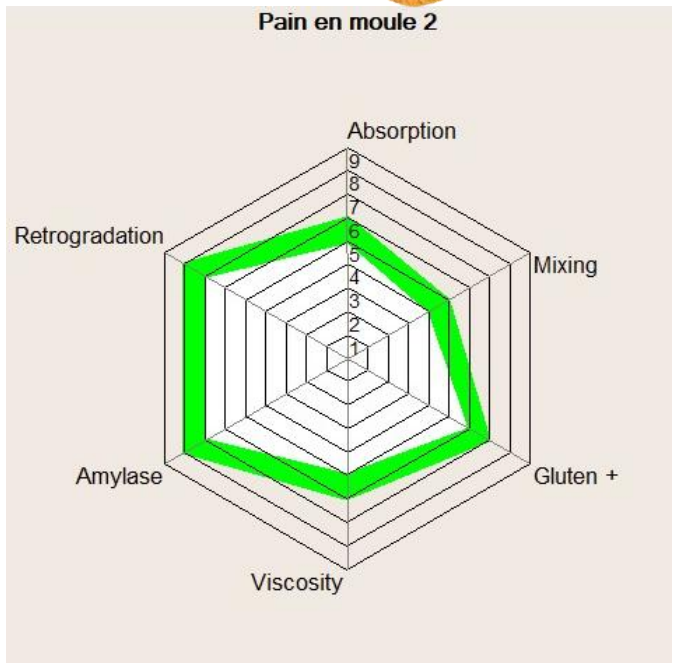


FLOUR + PROCESS = FINAL PRODUCT

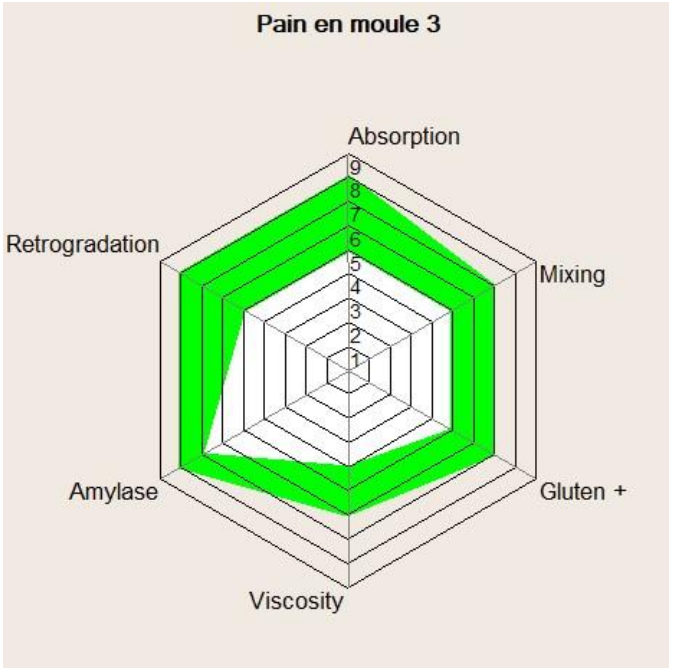
Country 1



Country 2



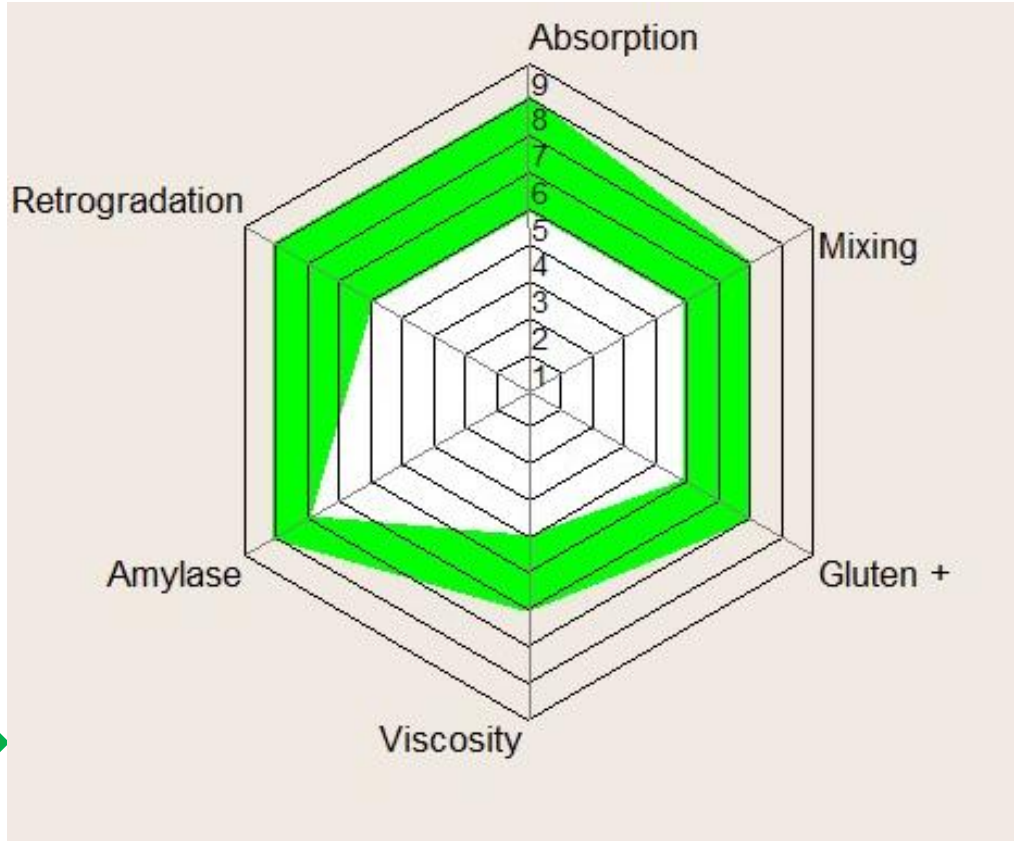
Country 3



REAL-LIFE EXAMPLE: STEP 1 = DEFINE THE ADAPTED PROFILE

Example of an industry who manufactures **Pan Bread**.

The first step of the project was to determine the target profile by analyzing **21 process-adapted flours.**



CREATE SPECIFICATIONS BASED ON WHAT WORKS **FOR YOU**

N° Sam	Absorp	Mixing	Gluten+	Viscosity	Amylases	Retrogradation	% in profile
1326	IN	IN	IN	IN	IN	IN	100%
1327	IN	IN	IN	IN	IN	IN	100%
1345	IN	IN	IN	IN	IN	IN	100%
1347	IN	IN	IN	IN	IN	IN	100%
1543	IN	IN	IN	IN	IN	IN	100%
1546	IN	IN	IN	IN	IN	IN	100%
1719	IN	IN	IN	IN	IN	IN	100%
1720	IN	IN	IN	IN	IN	IN	100%
1836	IN	IN	IN	IN	IN	IN	100%
1985	IN	IN	IN	IN	IN	IN	100%
1986	IN	IN	IN	IN	IN	IN	100%
1545	IN	IN	IN	IN	IN	IN	100%
1365	IN	IN	OUT	IN	IN	IN	83%
1548	IN	IN	IN	OUT	IN	OUT	67%
1837	IN	OUT	OUT	IN	IN	IN	67%
1346	IN	IN	IN	OUT	OUT	OUT	50%
1544	IN	IN	OUT	OUT	OUT	OUT	33%
1547	IN	OUT	OUT	OUT	IN	OUT	33%
1721	IN	IN	OUT	OUT	OUT	OUT	33%
1838	IN	IN	OUT	OUT	OUT	OUT	33%
1987	IN	IN	OUT	OUT	OUT	OUT	33%

WELL PERFORMING flours profil «Inside»

Part of uncertainty

NON PERFORMING flours profile "OUT"

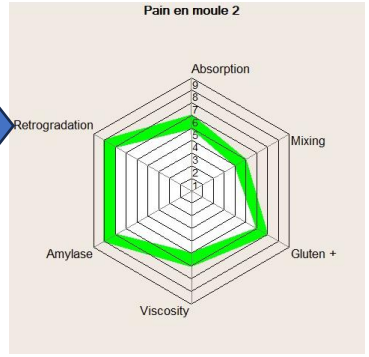
Non-discriminant

The Mixolab improves communication between millers & bakers!

Focus on what is **GOOD**

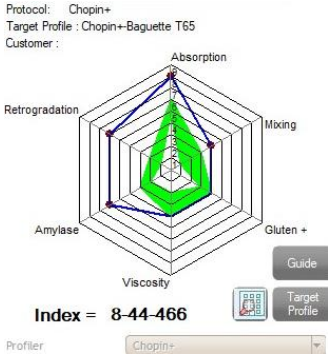
Analyse **WELL PERFORMING** flour

Use the Fingerprint as your **SPECIFICATIONS**



Not only protein-based

CHECK if new flour fits Specs



CORRECT **IF** and **WHERE** needed

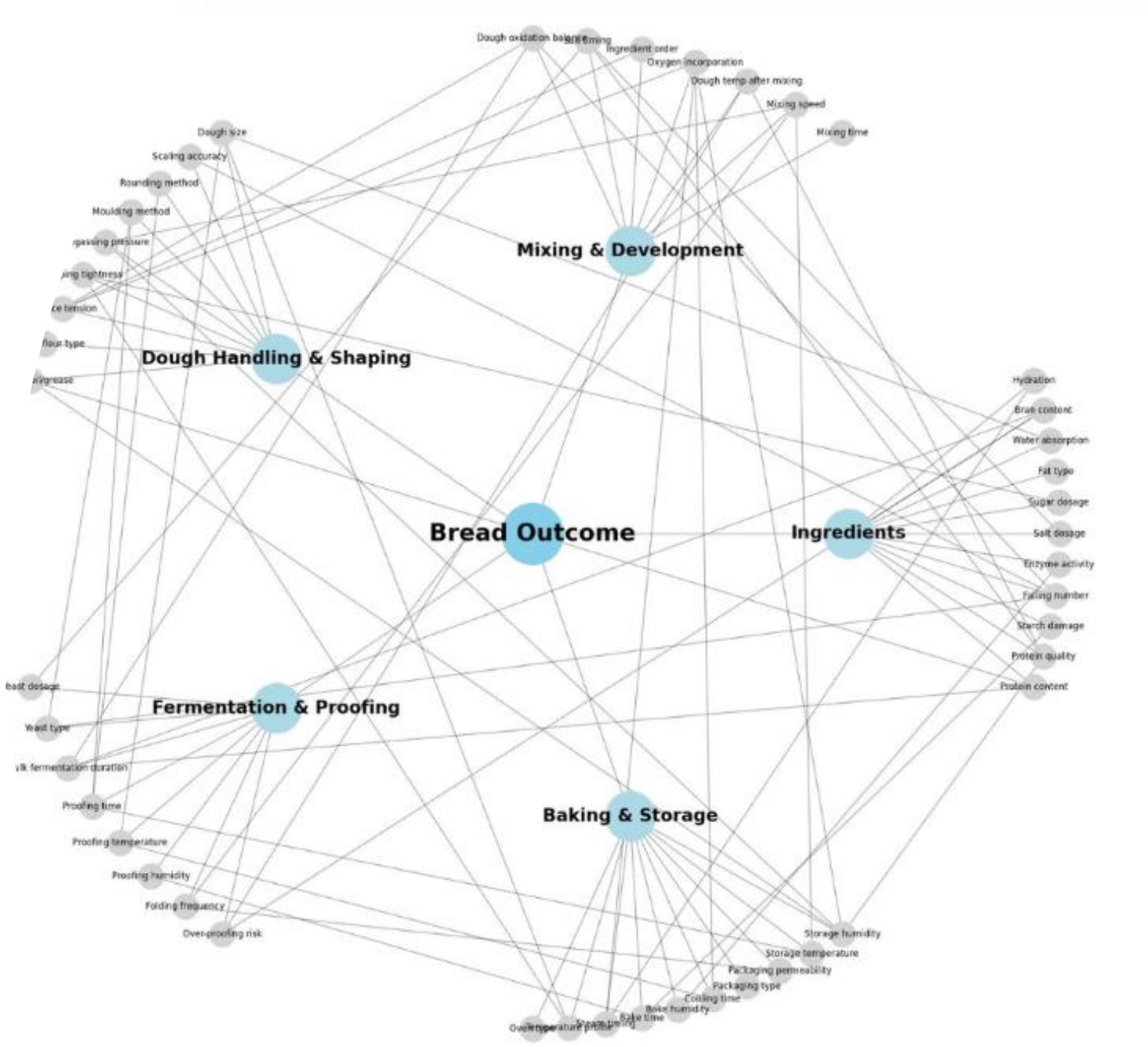
Not only protein-based

IMPROVE COMMUNICATION

What if bread was more complex than flour?

- Baking is a complex matter, and flour is an important, yet just a part of the final outcome.
- We cannot predict the final result just by looking at the tablespoon of flour.

→ Let's start measuring what is really happening instead!



Analyze both flour AND dough with the Mixolab 300

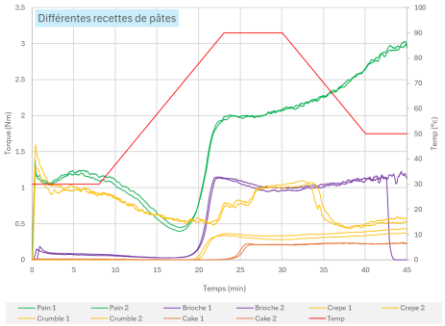
- Mixolab 300 allows to analyze DOUGH taken directly from the production lab, or the lab.

→Perfect companion for baking tests

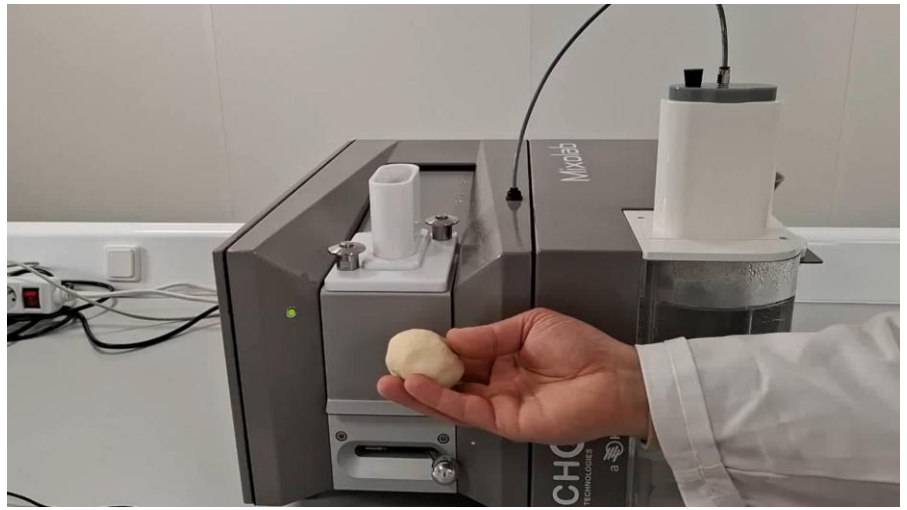
→Replace subjectivity by numbers

→See how the ingredients interact together in a dough system

→…



NEW

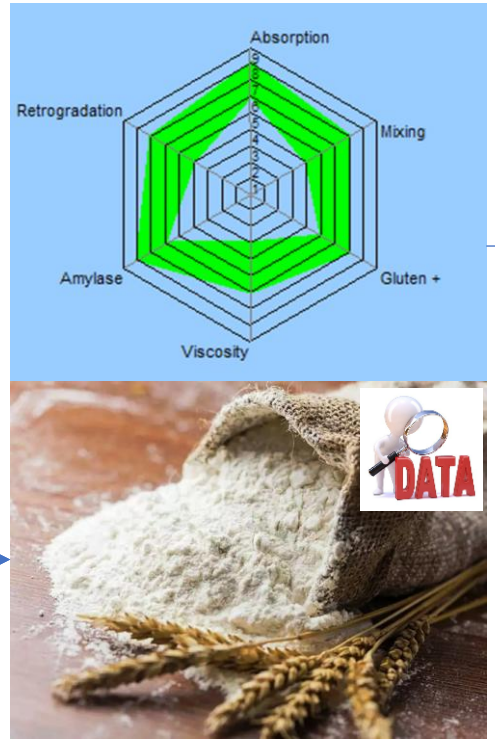


The modern QC in which we believe: Guess less, Measure more…

MEASURE PROCESS REAL PERFIORMANCE

UNDERSTAND HOS RECIPE AND PROCESS IMPACT FINAL PRODUCT

DEFINE THE DOUGH CHARACTERISTICS AND FOLLOW CONSISTENCY



DEFINE THE BEST FLOUR ACCORDING TO THE PROCESS

GIVE MILLER SPECIFICATIONS BASED ON OBJECTIVE MEASUREMENT OF WHAT REALLY WORK AT PLANT LEVEL, REDUCE WEIGHT OF “EMPIRISM” or “EXPERIENCE”

ONLY WHAT YOU CAN MEASURE, YOU CAN IMPROVE

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Thank You For Your Attention!

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