



Milling Solutions Flour Service. Consistent Flour Quality with optimal process conditions and tailor made flour ingredients

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Innovations for a better world.

BUHLER

5 Mega Trends.

Change of consumers behavior



Health

Improving health and fitness is now a key focus of consumers across Southeast Asia, particularly through their diets and exercise.



Mass Urbanization

Over half of the world's population now lives in cities and more than 70% will do so by 2050.



Rising Middle Class

By 2022, another billion people will join the global middle class and by 2030 it is estimated over 90% of the middle class will live in emerging markets.



Digital Consumer

New age consumers know more, expect more and also want things faster, driven by internet and mobile technologies.



Focus on Sustainability

Consumer awareness for environmental issues is increasing and sustainable business practices is influencing their purchasing decisions.

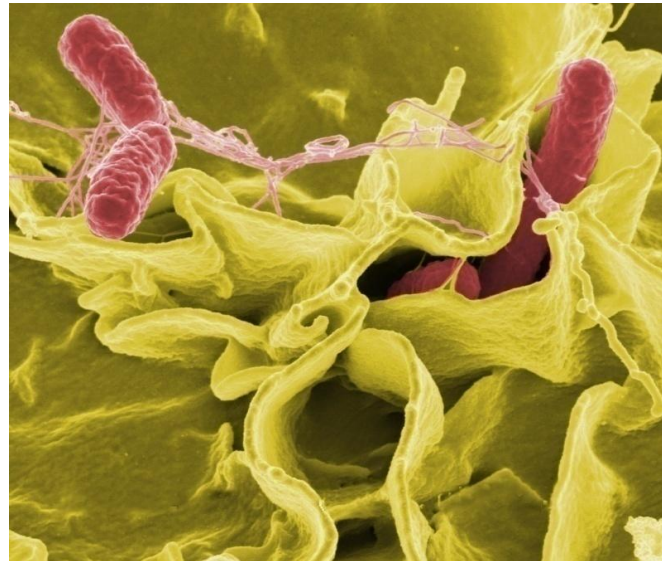


Food Safety.

Salmonella in dry foods



- Pesticide
- Fungicide
- Microorganism:
 - Salmonella
 - Clostridium perfringens
- Aflatoxin, Mycotoxin



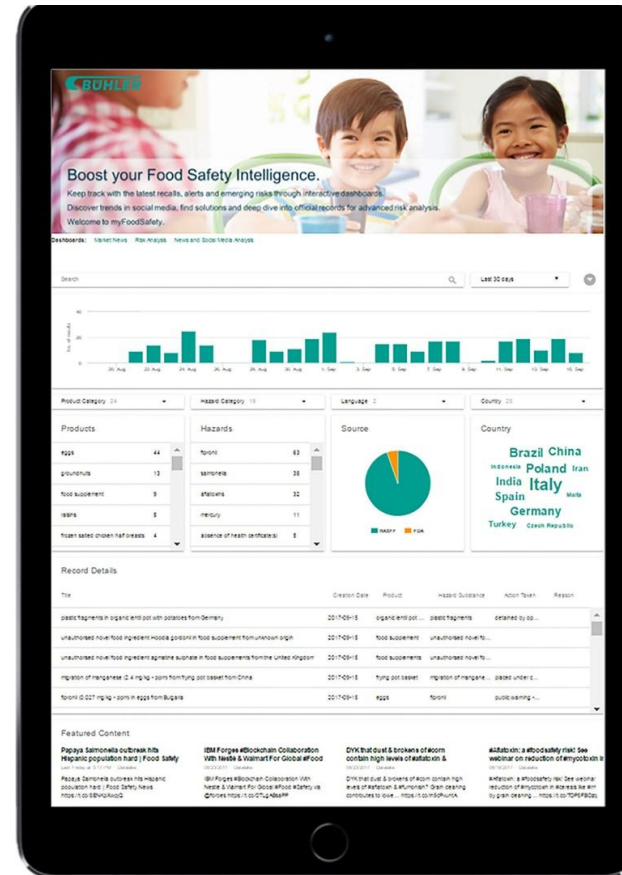
Food Safety.

Food safety early warnings



- **What?**
 - The latest recalls, alerts and warnings
- **Where?**
 - From official sources, the web and social media
- **When?**
 - In real-time
- **How?**
 - In a single place (Web dashboard)

[Safefood.ai](https://safefood.ai)



Trends in the Baking Industry.

Baking “New Artisanal” or fully Automated Production Lines



- Trendy, lifestyle
- Broad product portfolio
- Labor intense
- Own Shops
- Smaller lots
- Variations



- Maximize productivity with continuous processes
- Highly standardized ingredients (input) and processes with Quality control (in line)
- High automation degree with data tracking (monitoring), capacity usage 24 x 7
- Consistent quality with standardized processes
- Fast changing production to other products

Trends in the Baking Industry.

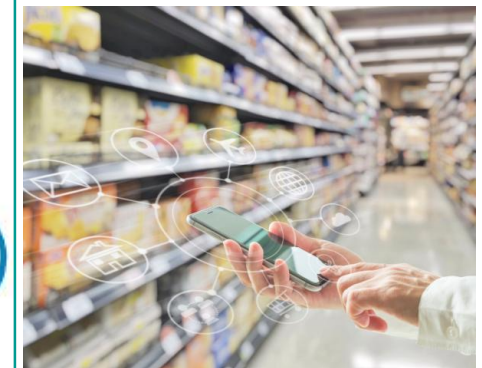
Smart Food Factory of the future

- Just in time principle, mass customization
- Fully automated communication between process steps
- Intelligent, self-learning process adjustments for high performance

Global
connected
Facilities

Smart
Products

Social
Smart
Devices



Trends in the Milling Industry.

Drivers...



- **Urbanisation** drives investment into wheat flour and food production.



- **Globalization** drives consolidation of the milling industry, move to higher capacity highly automated.



- **Rising energy/production costs** drives higher plant efficiency.



Trends in the Milling industry.

Bigger automated plants with high food safety requirements



Developed Markets

Market
Trend →



Emerging Markets

Market
Trend →

- Market consolidation
→ growth of market leaders (volume, vertical integration)
- Shift to bigger scale plants
- Increasing food safety requirements and traceability
- Demand for automated plants (with digital services)
- Automated packing lines



What is important for the Millers?

Challenges

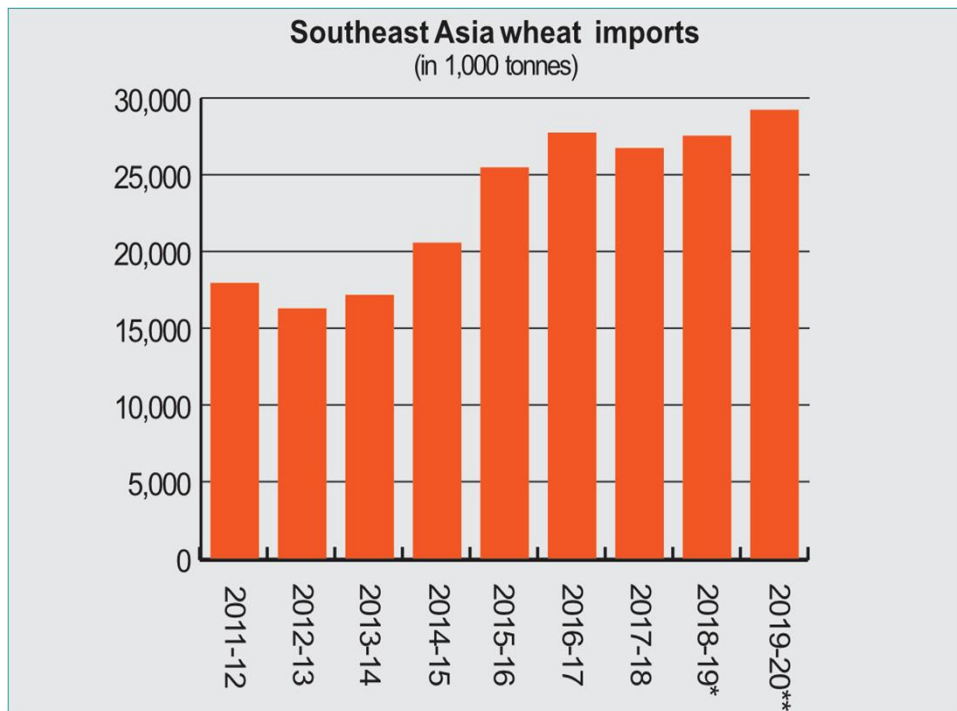


- Wheat sourcing (price, “quality”, availability)
→ Professional procurement
- Make the best out of the raw material
→ High yield, create value out of by products
- Efficient plant operation, highly automated
→ Lowering production cost
- Top technology and equipment
→ High quality products
- High sanitation, plant engineering
→ Food Safety, easy to clean
- **Consistent flour quality** for different applications
→ *Meet flour specifications*



Trends in Wheat Flour Milling.

Wheat Imports SEA

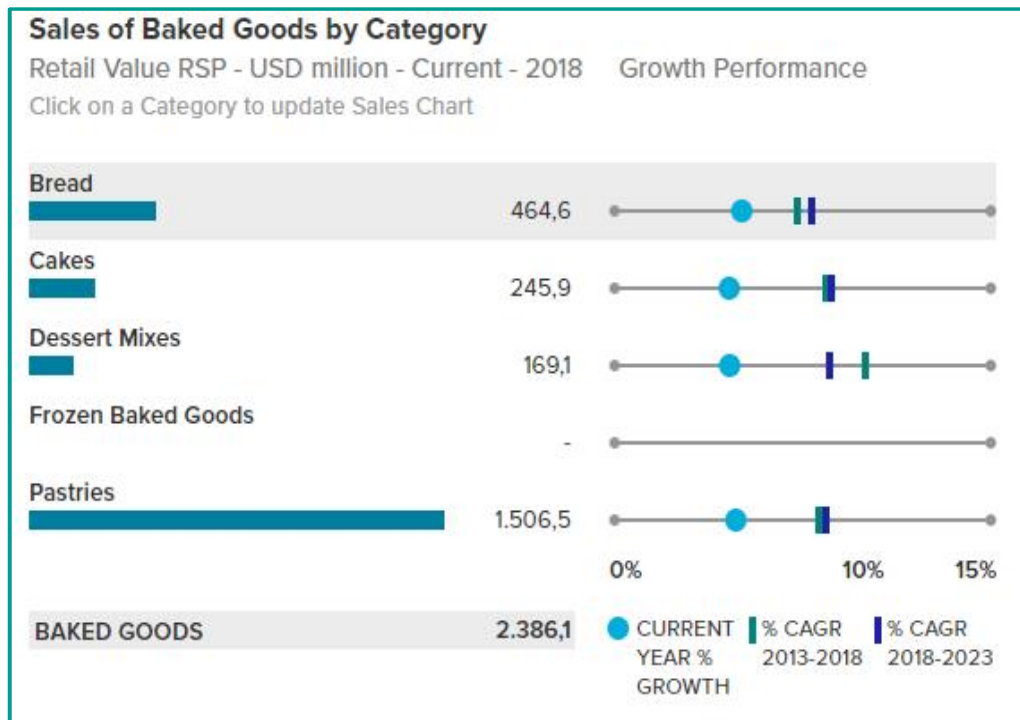


EUROMONITOR 2018

- Wheat import accounts 11.4 million tons for Indonesia, 6.8 million for the Philippines, 4.4 million for Vietnam, 3.2 million for Thailand and 1.8 million for Malaysia.
- Expansion in the flour milling sector, leading to stronger competition, a rise in imports of wheat from Argentina, US and Black Sea.
- In addition to competitive prices, Ukrainian wheat quality has significantly improved in recent years, allowing for higher rates of blending.

Trends in Wheat Flour Milling.

Flour Consumption increased significantly in Indonesia



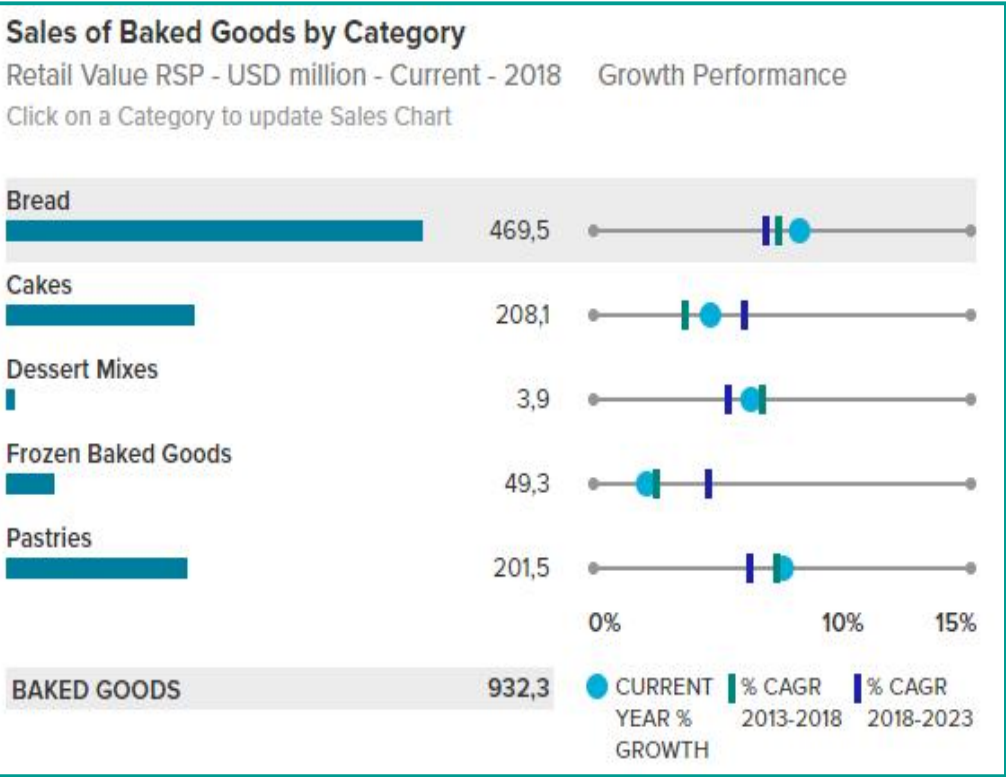
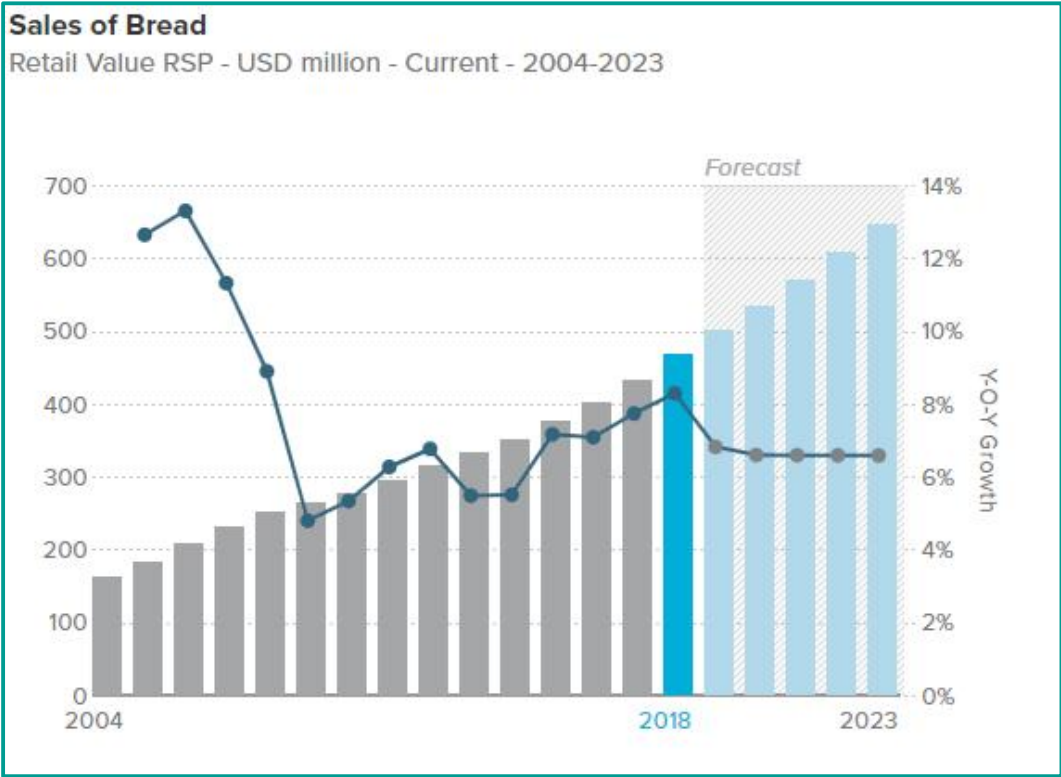
EUROMONITOR 2018

- Consumption of wheat flour by the average Indonesian per year was 25 kg in 2017-18, having risen from 23 kg in 2015-16.
- “Rather than eating rice three times daily, many Indonesians have switched to eating bread or noodles for breakfast.
- Restaurants and high-end bakeries are also driving demand for wheat-based food products, especially in major cities, including Jakarta, Surabaya, Medan and Bandung.
- In addition to noodles, more high-end and artisan bakeries are coming online, driving the bakery industry, which already accounts for 20% of flour consumption.
- The noodle industry consumes still ~ 65% of wheat flour.



Trends in Wheat Flour Milling.

Flour Consumption increased significantly in Philippines



EUROMONITOR 2018

Market Opportunities.

Standard Flours and Special Flours

Standard Flours



Multipurpose

Classification mainly based on
ash content

Constant quality through grist
selection

Special Flours



Product and process
application specific

Classification based on
specific product applications

Specified quality through purity
of wheat variety

Market Opportunities.

Bread Premiumization



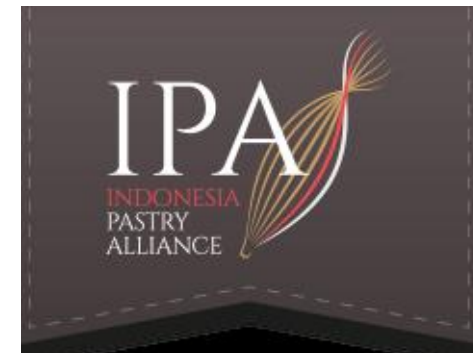
Long shelf-life



Softness and taste

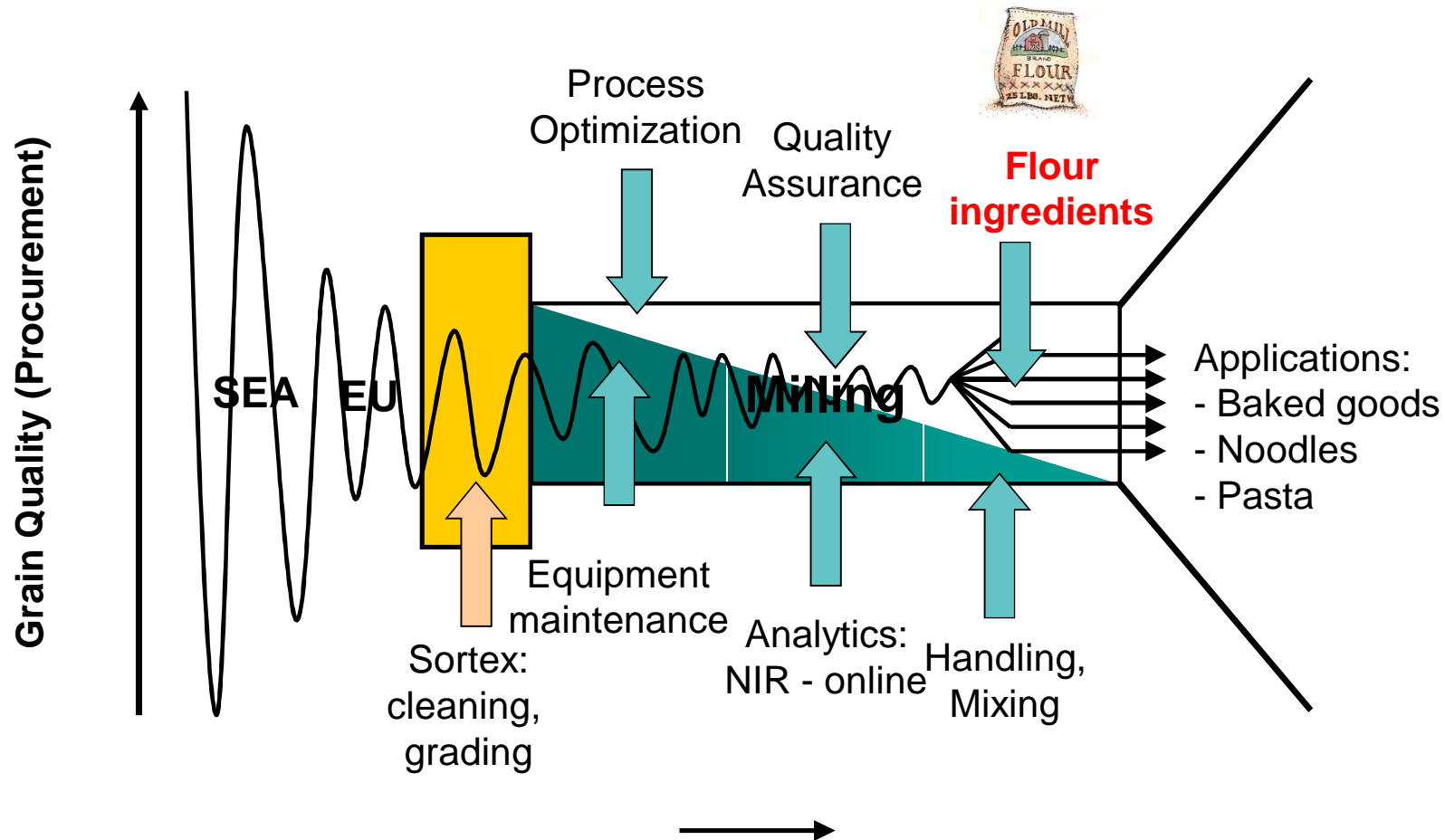
Market Opportunities.

Pastries and Cakes market on the rise



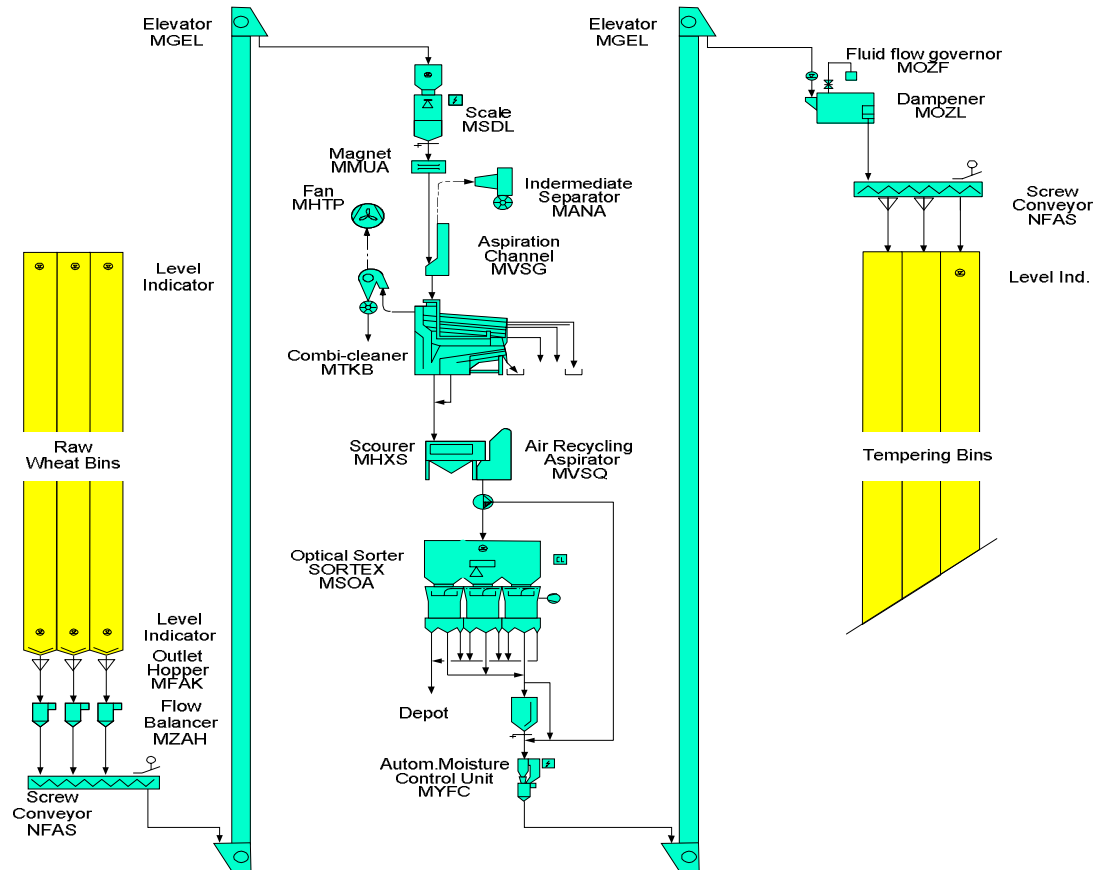
Product Quality Optimization along the Value Chain.

Optimizing flour quality by processes - technology and flour ingredients



Milling Solutions Wheat processing.

100% Scouring before SORTEX – for pure and safe products

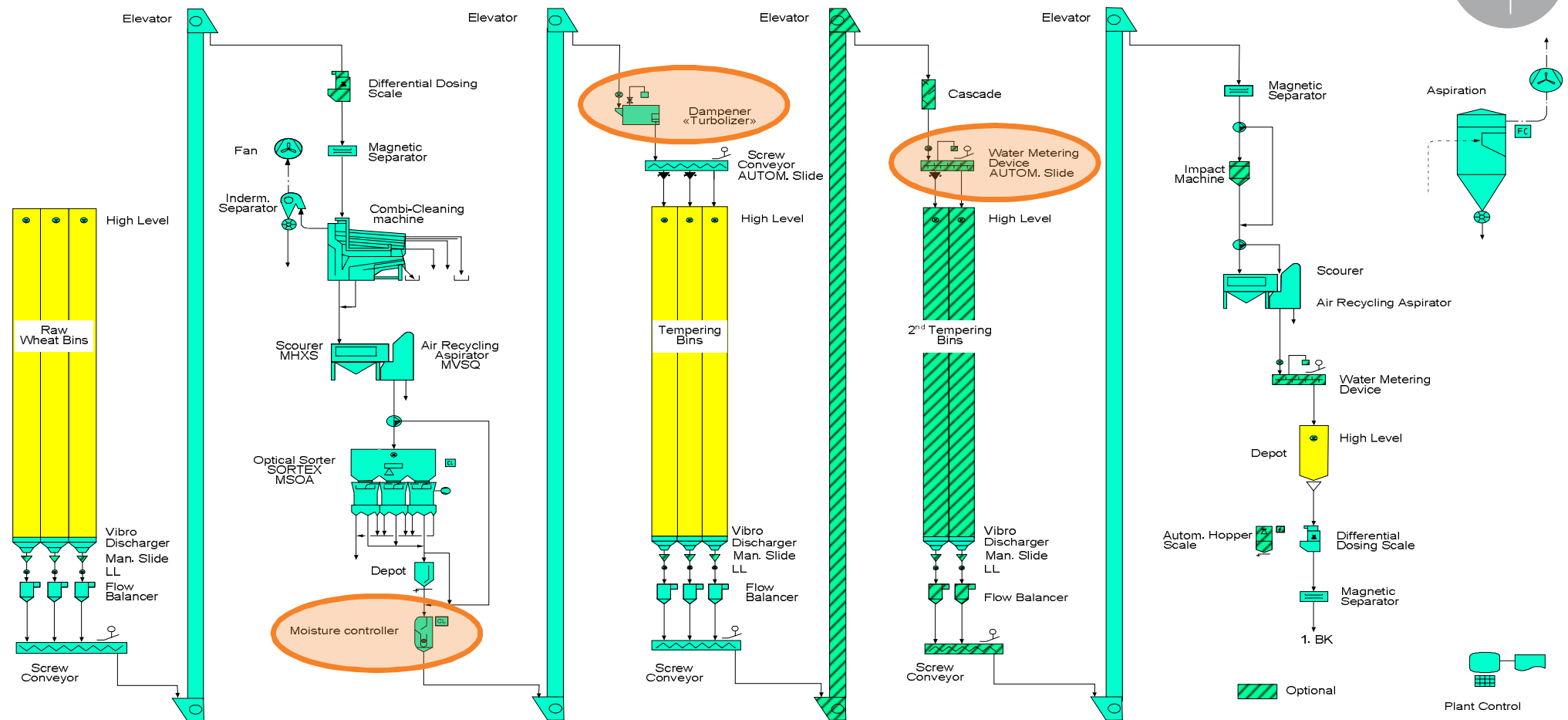


Installation of scourer before SORTEX

- Reduction of compressed air (cleaner product getting to the SORTEX)
- Sortex less dusty inside (less wiping)
- Un-threshed / hulled kernels are relieved → less good product into screenings
- Sortex without resort
 - Capacity max. 4t/h per chute
 - Contamination < 1% (Wheat)

Milling Solutions Wheat processing.

Wheat conditioning – single wheat

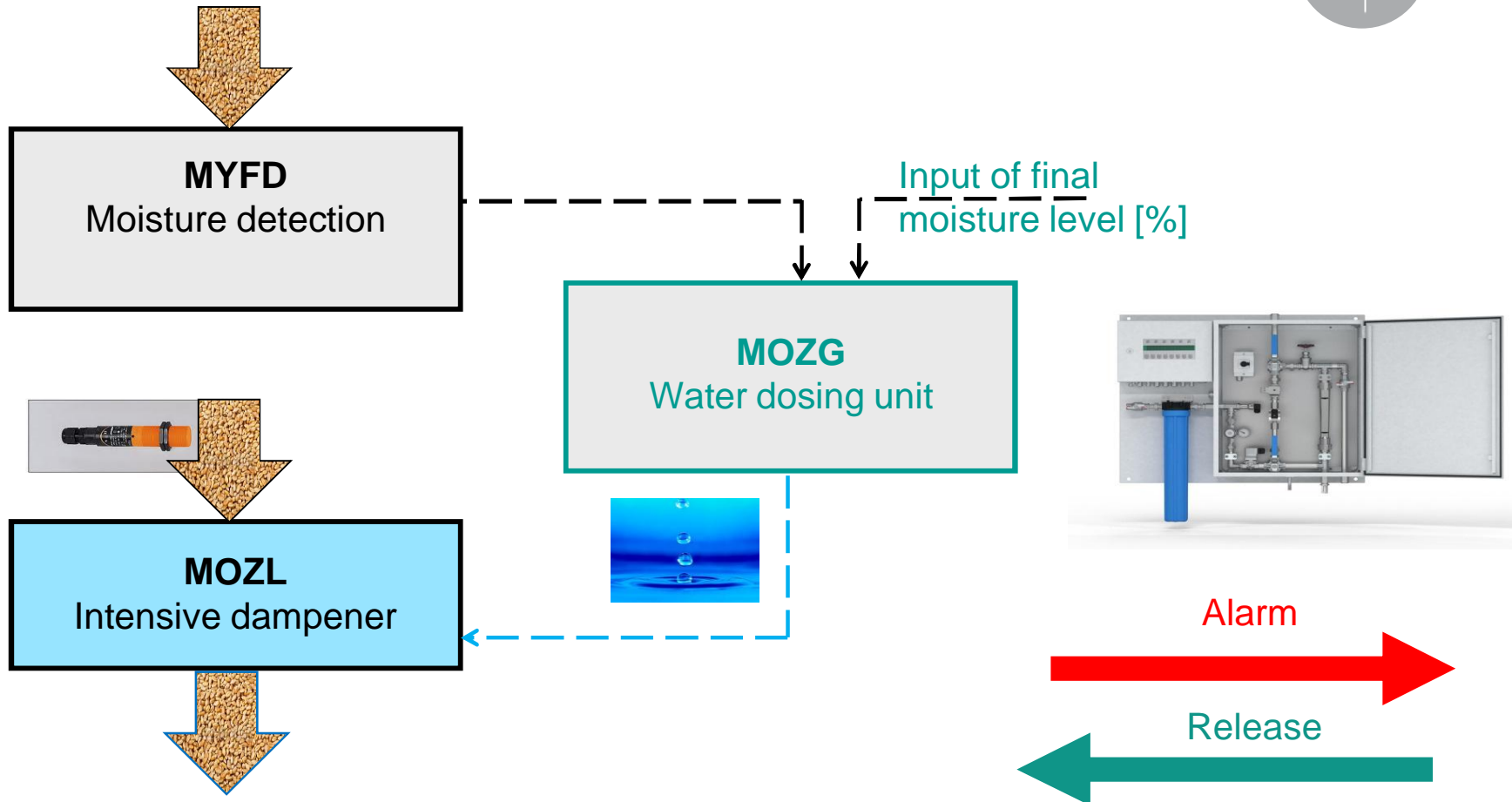


Milling Solutions Wheat processing.

Automatic moisture control for grain - dampening equipment & data flow

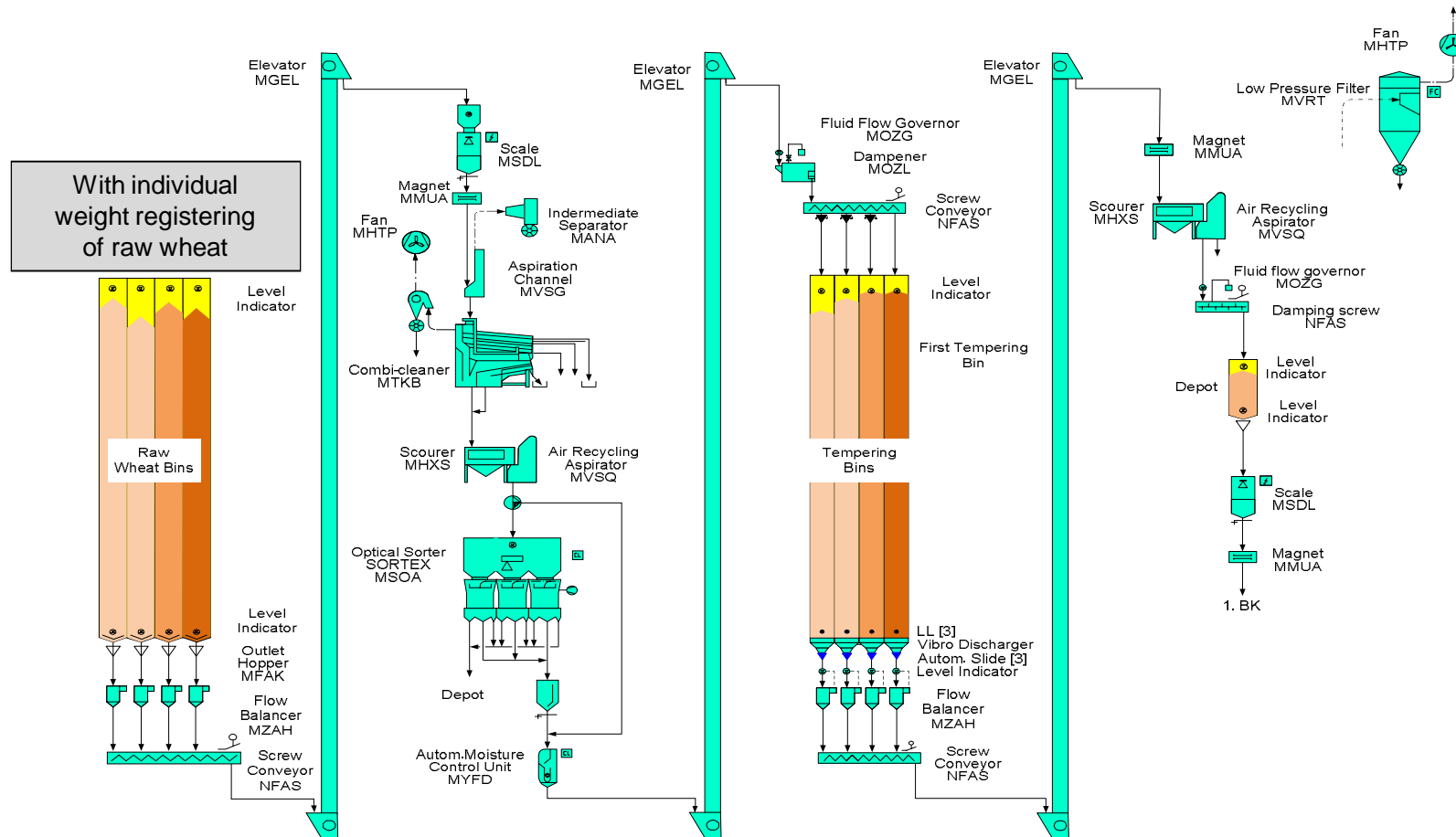


Product flow
sensor



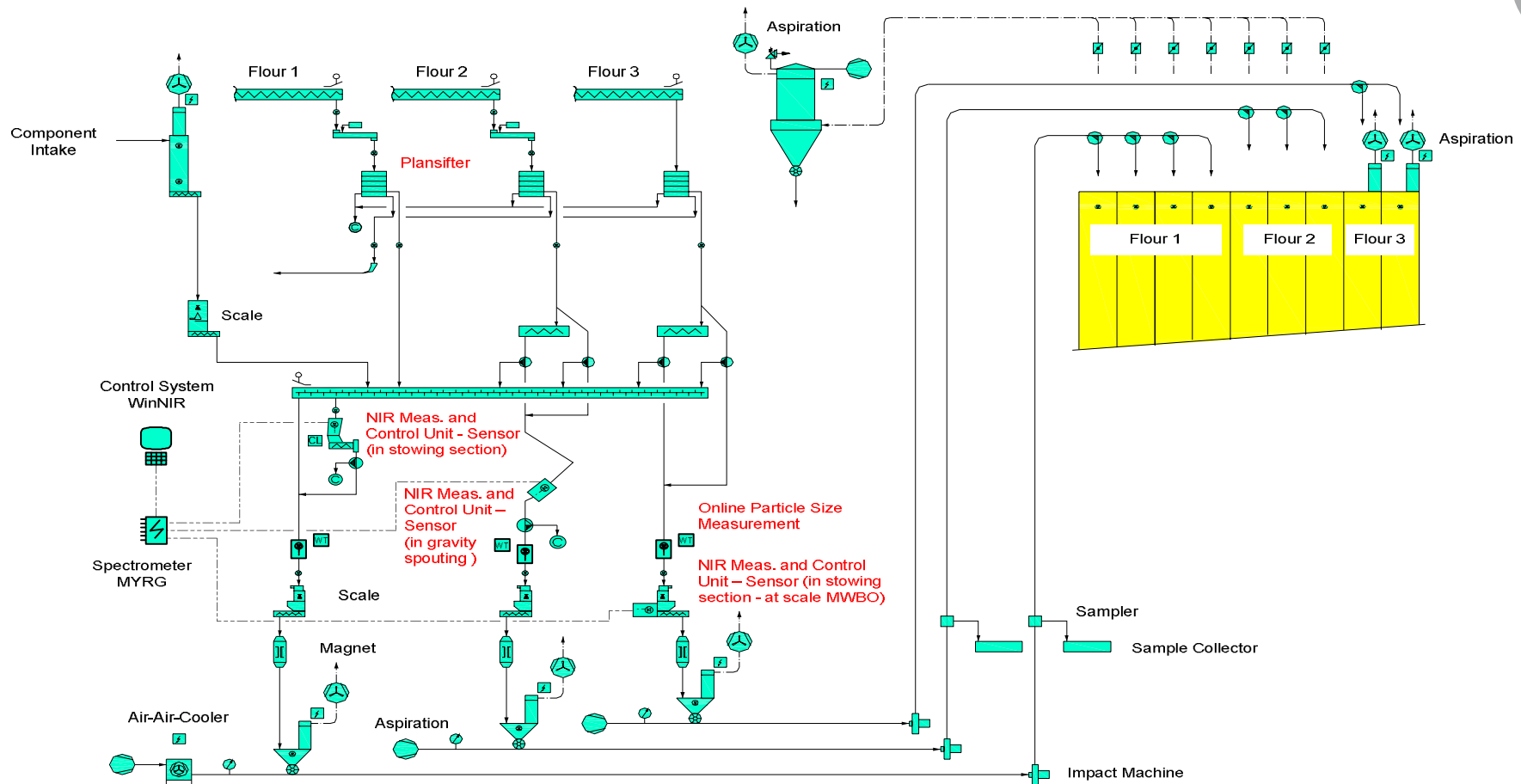
Milling Solutions Wheat processing.

Wheat blending after tempering bins - fast change of wheat blend



Milling Solutions Wheat processing.

Bin Filling – from mill to flour silo



Flour Ingredients in Milling and Baking.

Effects of enzymes and glutathion



	Amylase	Hemicellulase	Glucose-Oxidase	Lipase	Phospholipase	Protease	Amyloglucosidase	Glutathion
Reduced proof time	✓							
Decreased proof time in frozen dough						✓		
Improved loaf volume	✓	✓	✓		✓			
Improved tolerance during proof				✓				
Increased extensibility		✓			✓		✓	
Dough strengthening			✓					
Reduction of dough stickiness		✓	✓					
Replacement of DAWE/SSL				✓				
Mild dough relaxation								✓
Finer crum structure		✓		✓				
Improved crumb softness	✓	✓			✓			
Improved crispness of crust			✓					
Darker crust colour	✓					✓		
Increased shelf-life	✓			✓	✓			

Flour Ingredients in Milling and Baking.

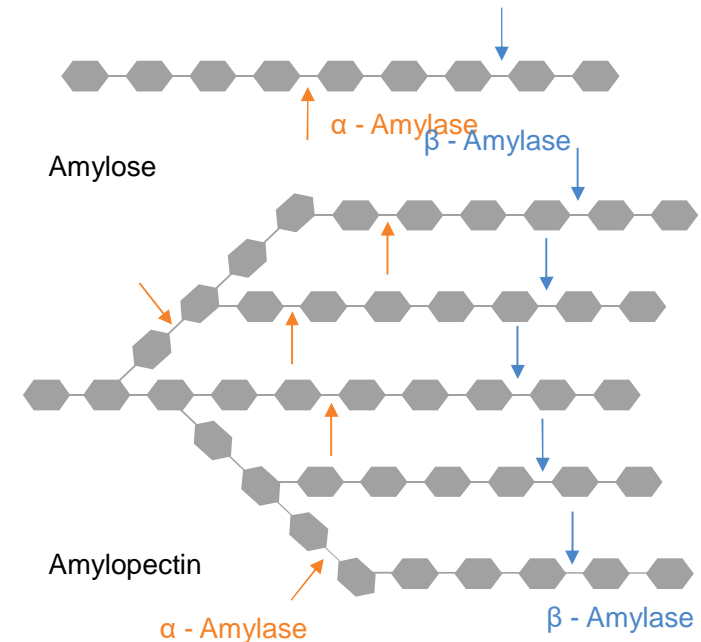
Amylases



α -Amylase:

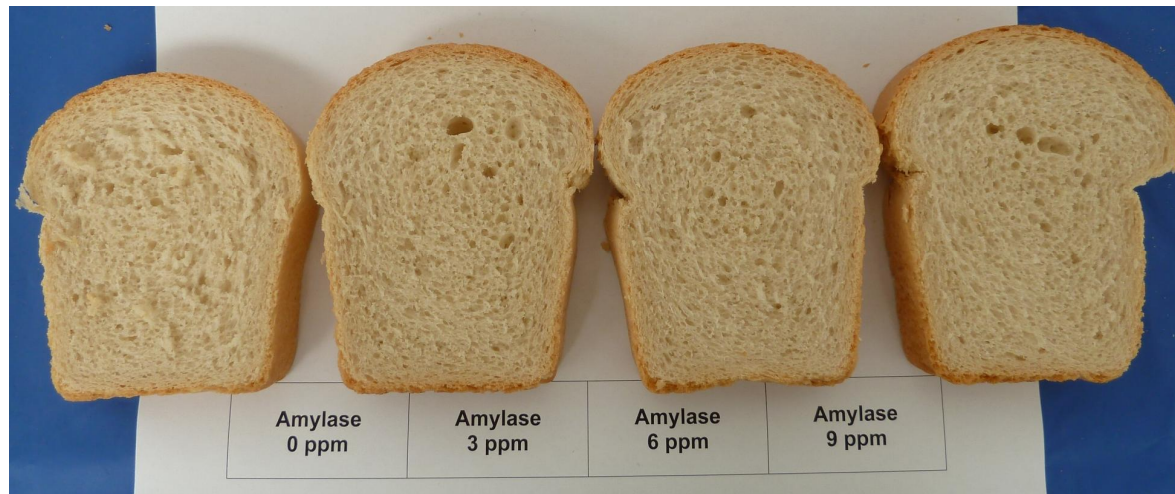
- Performance
 - Breaks down damaged starch
- Benefits:
 - Reduced proofing time
 - Higher bread volumes
 - Improved crumb softness
 - Better crust color
 - Increased shelf-life

- Production of maltose, used by yeast cells to grow, important for dough fermentation.



Flour Ingredients in Milling and Baking.

Amylases



Flour Ingredients in Milling and Baking.

Oxidizing Agents – strengthen gluten (sulfide bonds)



Performance:

- Oxidation of “gluten SH” groups

Benefits:

- Improved dough-forming properties
- Better dough machinability (dough stability)
- Dough strengthening (gluten network)
- Higher water uptake (gluten strengths)
- Reduction of dough stickiness
- Improved dough tolerance
- Color L-value

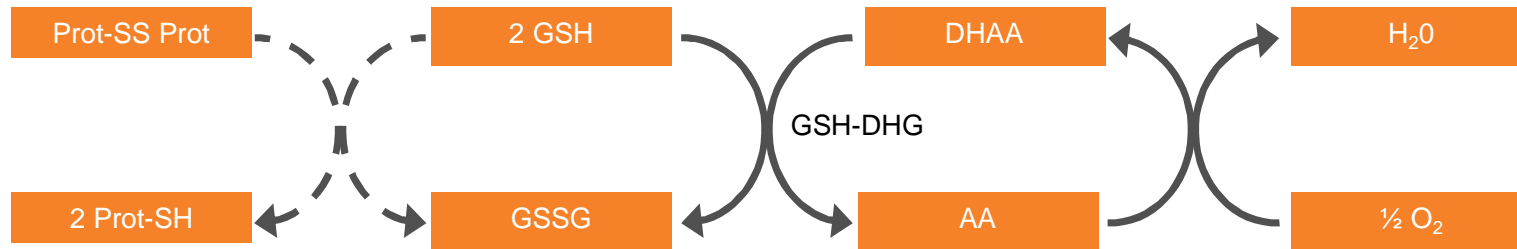


Flour Ingredients in Milling and Baking.

Oxidizing Agents – Ascorbic Acids



Pathway of gluten oxidation:



- GSH, GSSG: Reduced and oxidized glutathione
- AA: Ascorbic acid
- DHAA: Dehydroascorbic acid
- Prot: Protein

Disulfid bonds retain CO₂ produced by yeast in the dough


- Higher gas retention

Flour Ingredients in Milling and Baking.

Oxidizing Agents Glucose Oxidase (GOD)



Reference with 15 ppm Glucose Oxidase (GOD)



$\text{Glucose} + \text{O}_2 + \text{H}_2\text{O} \xrightarrow{\text{GOD}} \text{Gluconic acid} + \text{H}_2\text{O}_2$

Glucose oxidase works by oxidizing glucose and producing gluconic acid and hydrogen peroxide. Hydrogen peroxide is a strong oxidizing agent that strengthens disulfide and non-disulfide cross-links in gluten, thus better developing the dough and improving its machinability.

Flour Ingredients in Milling and Baking.

Proteases

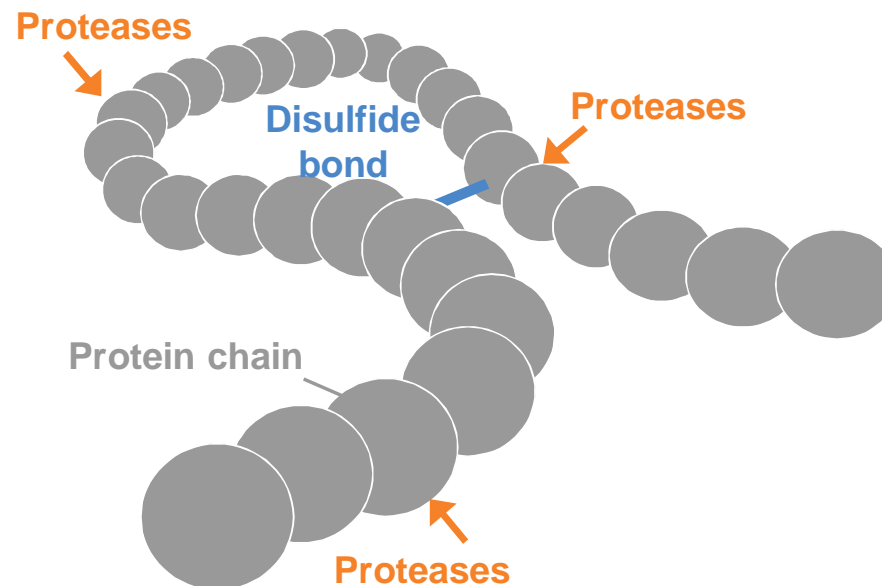


Protease Activity:

- Degradation of the gluten (protein) structure

Benefits:

- Softens the gluten
- Increased dough extensibility
- Decreases mixing time
- Short structure (e.g. texture in biscuits)



Flour Ingredients in Milling and Baking.

Lipases

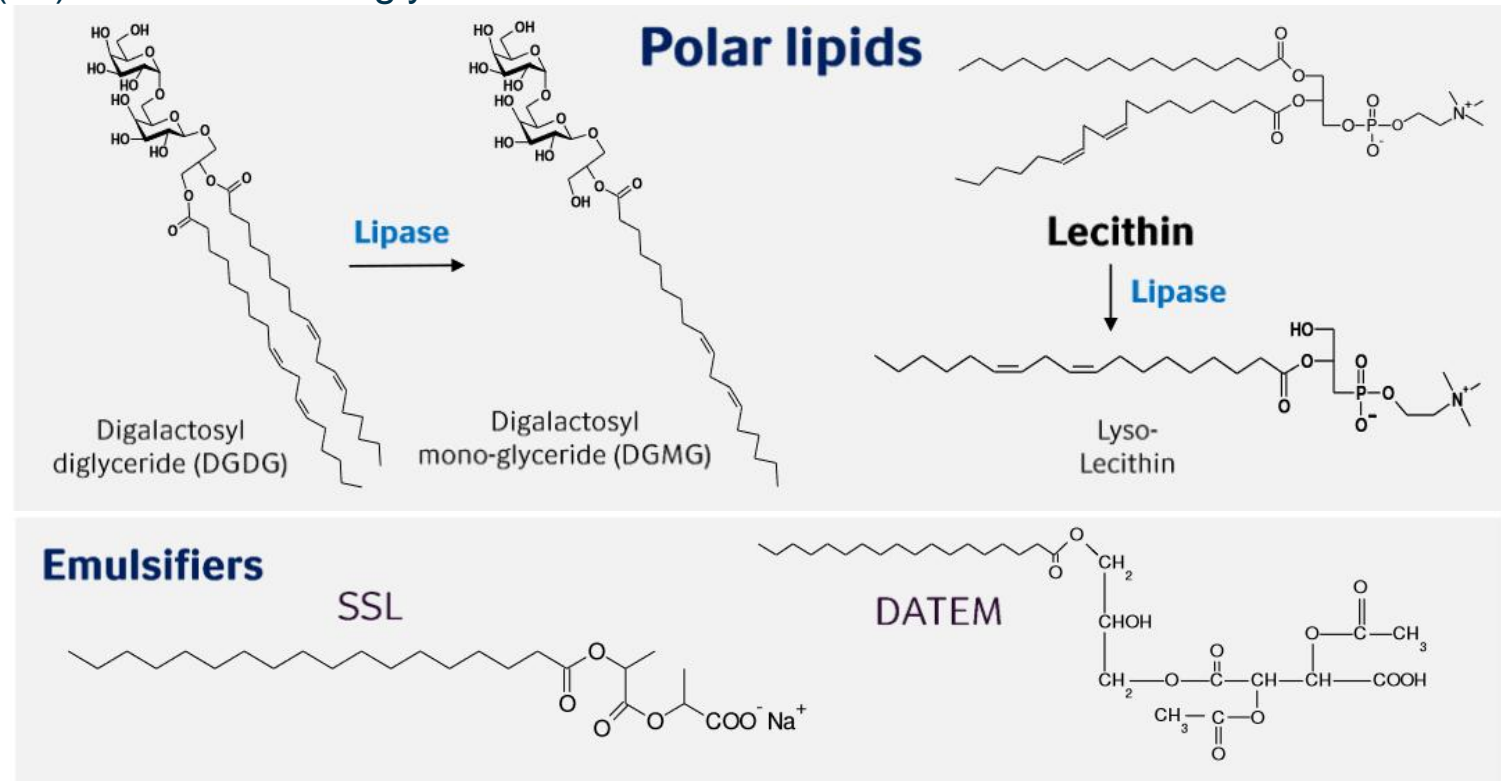


Performance:

- Hydrolysis of triglycerides (fat) to di- and monoglycerides
→ Emulsifying properties

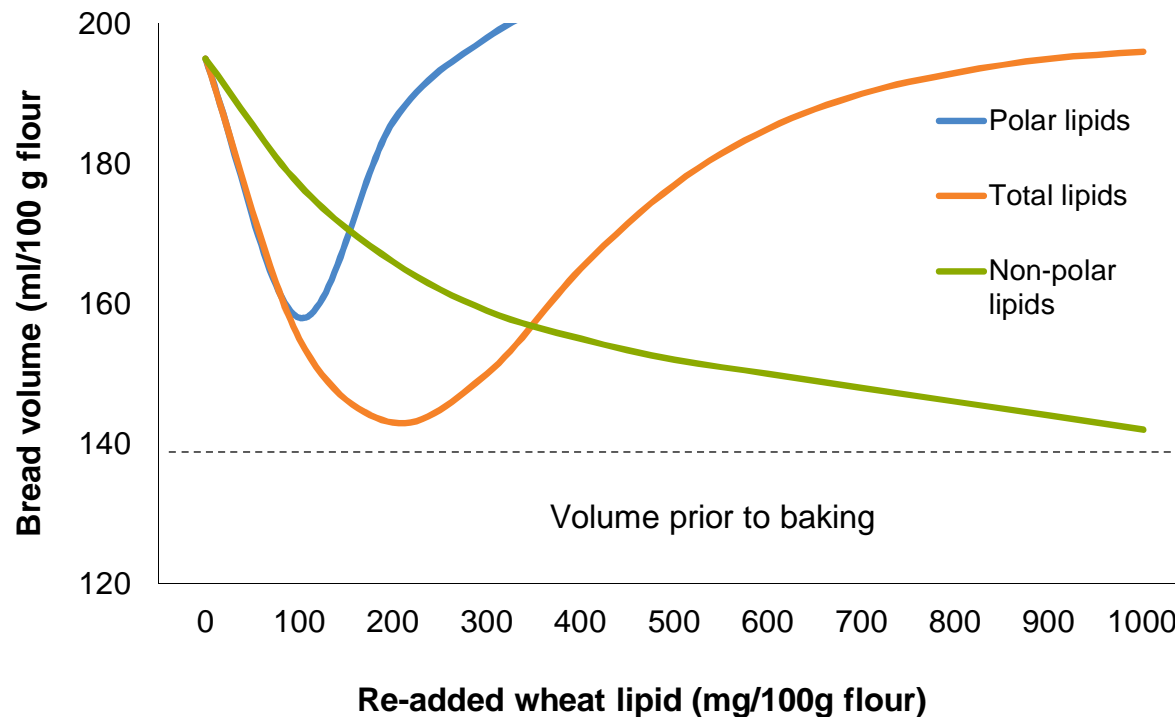
Benefits:

- Improved dough stability
- Increased crumb softness
- Finer crumb structure
- Increased shelf-life
- Higher bread volume



Flour Ingredients in Milling and Baking.

Effects of polar and non-polar wheat lipids on bread volume



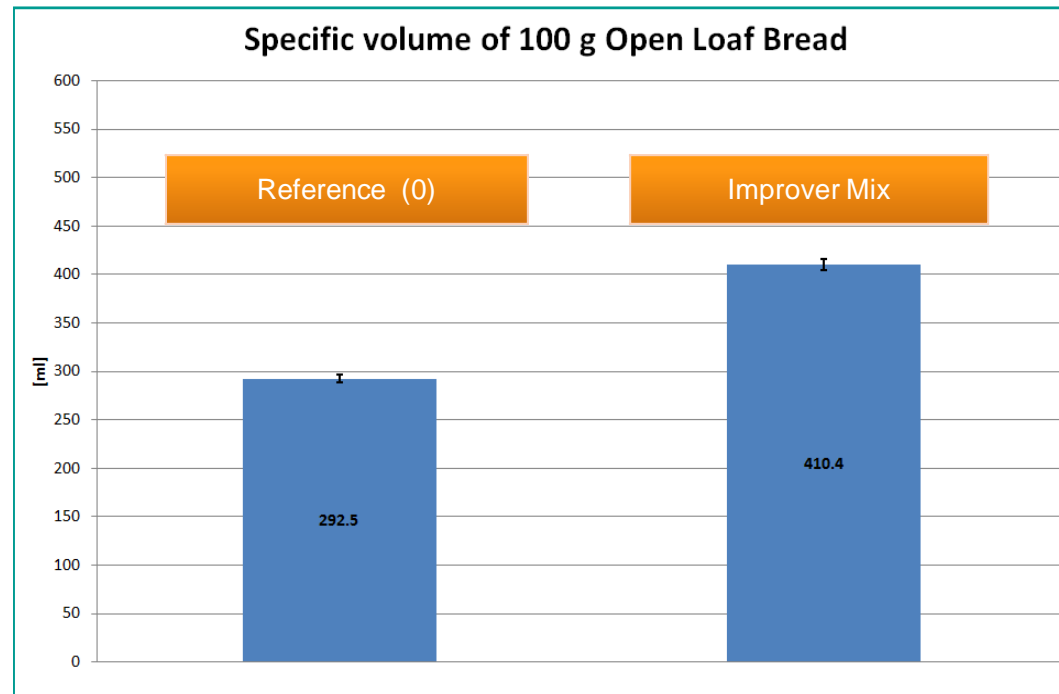
Milling Solutions Flour Service.

Bakery Improver – Open Loaf Bread



Main Benefits:

- Higher dough stability
- Significant more volume
- Extension of shelf-life



Milling Solutions Flour Service.

Bakery Improver – Toast Bread

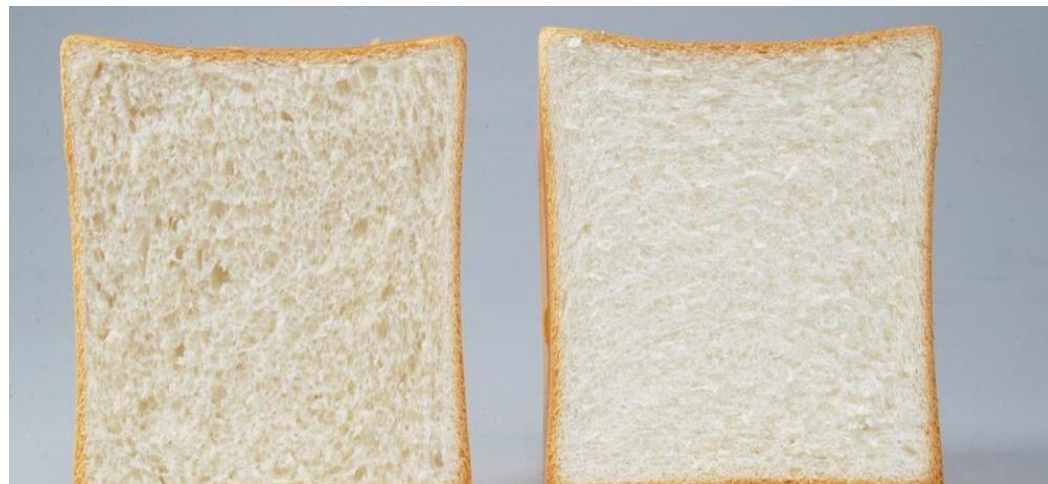


Main Benefits:

- Fine crumb structure
- Softness of texture
- Brighter color (L-value)
- Extension of shelf-life
- Flavor improvement

Reference (0)

Improver Mix



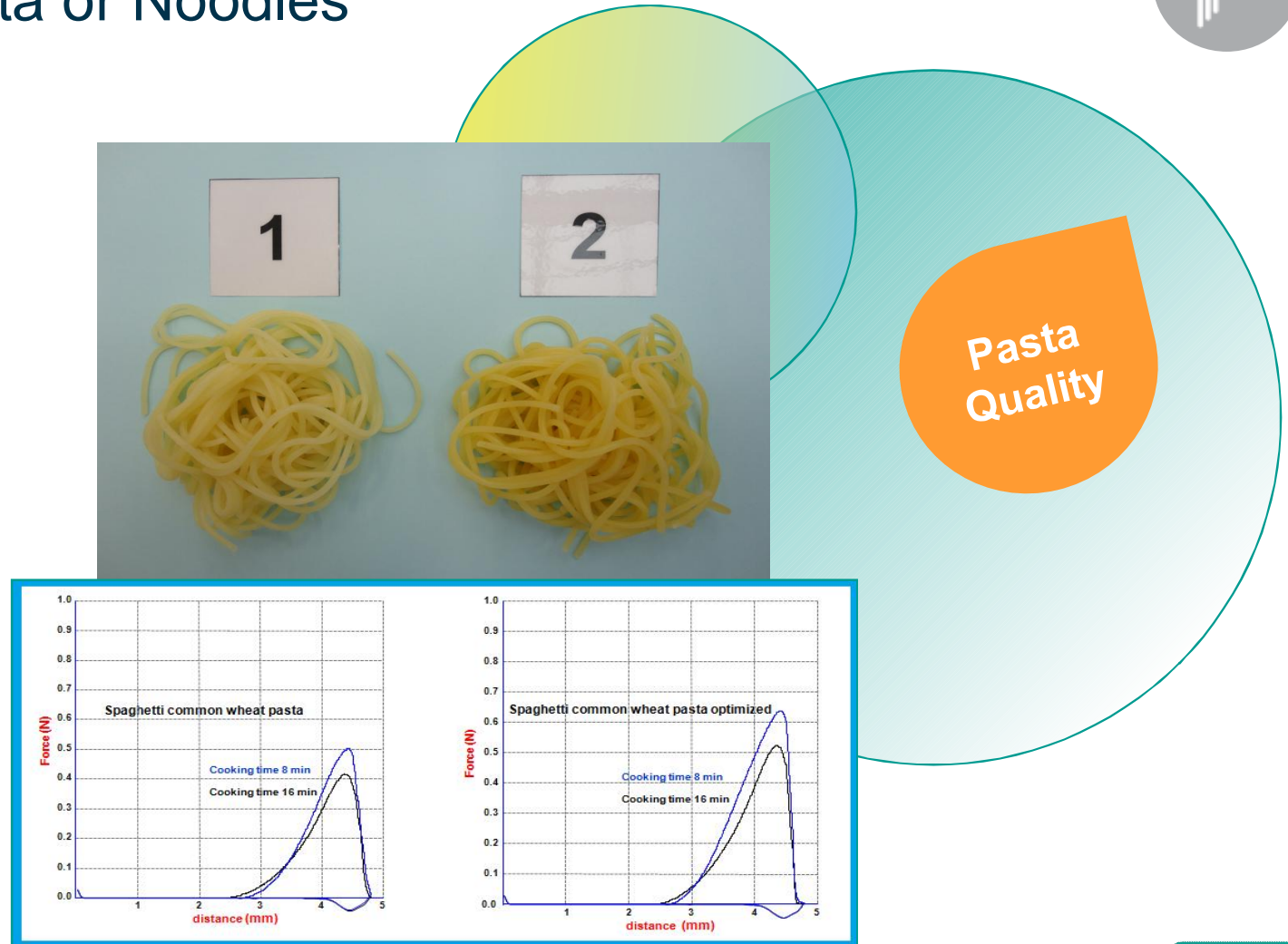
Milling Solutions Flour Service.

Flour Improver in Pasta or Noodles



Main Benefits:

- Less stickiness
- Al-dente texture (bite)
- Less cooking losses
- Improved cooking tolerance
- Pleasant color



Milling Solutions Flour Service.

Our Application Centers



Bakery Innovation Center Switzerland



Bakery Application Center Iran



Bakery Application Center Kenya



Bakery Application Center Indonesia



Milling Solutions Flour Service.

Bangsheng Food Ingredients Asia

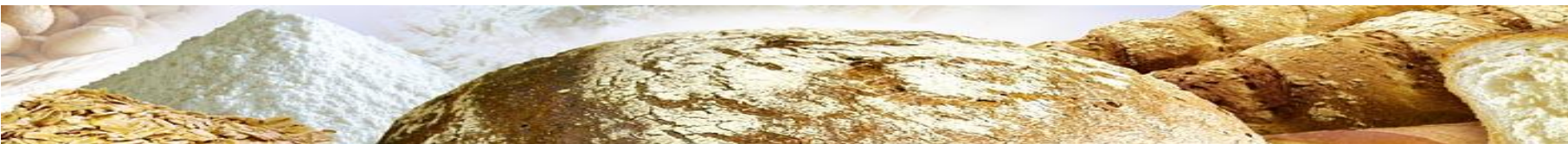


Milling Solutions Flour Service.

From Grain to Final Products - Our Solutions



- **Grain and Flour Quality Assessment** based on International Standards (AACC / ICC).
- **Process Optimization by Head Millers** to reach performance (efficiency).
- **Flour Quality Improvement** for specific applications like **Bread, Biscuits, Wafers, Pasta** or **Noodles**.
- **Development of Customized Flour Ingredient Solutions.**
- **Training Courses in Grain and Flour Analytics and in Baking.**



Milling Solutions Flour Service.

Contact

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