

Data-Driven Transformation of the **Agri-Food Industry**



The agri-food industry is increasingly turning to digitalization and data analytics to address challenges related to productivity, quality, and resource efficiency (raw materials, energy, water, etc.).

Adopting tools such as OIAnalytics helps companies shift from reactive management to proactive control. The example of the dairy company Fromarsac shows that digitalization has improved product quality, boosted productivity, and made the industry more attractive to younger generations.

Furthermore, the Six Sigma approach, supported by these tools, helps reduce process variability and ensure consistent quality. In short, data has become a “new essential ingredient” for ensuring success in the agri-food sector.



The food industry, a pillar of our economy, faces major challenges that are driving it to reinvent itself. At the heart of this transformation, digitalization and the intelligent use of production data are emerging as essential drivers of performance. From resource optimization to product quality control, data is becoming the new essential ingredient in the recipe for success.

Performance Challenges in the Food Industry

Performance in the food industry depends on a complex balance of critical factors. Manufacturers must constantly reconcile high productivity targets with non-negotiable constraints.

- **Product quality and consistency:** the main challenge is to guarantee impeccable product quality; for consumers, even the slightest variation in texture or taste can affect their perception.
- **Raw material efficiency:** Maximizing the yield of raw materials is a major economic and environmental challenge. Every gram of raw material (milk, grains, etc.) must be processed as efficiently as possible to minimize losses and increase profitability.
- **Energy efficiency:** With rising energy costs and environmental imperatives, reducing energy consumption (electricity, gas, steam) per ton of product has become a priority. The goal is to produce as much, or even more, while consuming less.
- **Traceability and safety:** Regulatory standards and consumer expectations demand seamless traceability, from raw materials to the finished product.
- **Attractiveness:** the sector must modernize its tools to attract younger generations by offering a digital work environment aligned with their habits and lifestyle.

Digitalization as a lever for change

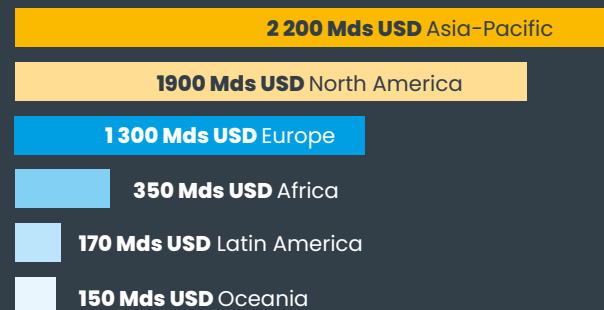
Faced with these challenges, digital transformation offers practical solutions. By collecting and analyzing data from production lines, quality control, maintenance, and, more broadly, the company's various processes, it enables a shift from reactive management to proactive, optimized operational control.

Digitalization enables:

- Monitor production in real time to adjust parameters and ensure product compliance.
- Monitor energy consumption and material flows to detect anomalies and overconsumption.
- Analyze historical data to identify the root causes of quality variations or yield losses.
- Facilitate communication and access to information for all employees, from the shop floor to management.

Some data on the agri-food industry

*The figures mentioned above concern the value of finished products intended for consumption.
Estimated revenue of USD 6,070 billion in 2024.
Annual growth estimated at 5.9%.*



The Benefits of OIAalytics

A specialized solution like OIAalytics is designed to transform raw data into actionable insights and provide users with easy-to-use business tools to take action across multiple areas.

- **Democratization of data:** OIAalytics makes performance data accessible and understandable to everyone. Operators can view the real-time status of their production line, make the right decisions, and measure the impact of their actions on quality, energy consumption, or material yield.
- **Going paperless:** The shift to tablet-based data collection eliminates manual data entry, a source of errors and wasted time. Information is centralized and instantly available.
- **Team engagement:** by giving employees the tools to better understand and improve their performance, these solutions boost engagement and encourage initiative.



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- **Process optimization:** this is the heart of the reactor. By correlating production parameters (temperature, speed, pressure, etc.) with results (quality, material yield, energy consumption), the solution's advanced analytics tools help identify optimal settings or the causes of deviations. This makes it possible to find the right balance for manufacturing a high-quality product while minimizing material waste and energy consumption.

Implementation example: **Fromarsac**

Fromarsac, a dairy processing company within the Savencia group, began its digital transformation in 2020.

The Challenge

At the start of the initiative, the main challenge was to reduce variability in the quality of its cheese preparations. Although the plant was equipped with numerous automated systems, it was unable to effectively consolidate and analyze data to control its processes with precision.

The example of Fromarsac perfectly illustrates how a structured approach to digitalization enables concrete solutions to the overall performance challenges of the food industry.



Sébastien Rosier
Operational
Excellence Manager

«Our problem has been **to have better control over the quality of our products**. On the one hand, we have a milk that is variable, what is [...] and we have consumers who want to have a standardized product, compliant and always with the same taste.»

The Solution

The company launched a digitalization initiative with Optimistik, with two objectives:

- Support real-time production line management.
- Conduct in-depth analyses to make longer-term strategic decisions.

This notably involved deploying tablets for employees, replacing paper-based records.

The Results

The benefits of this transformation were measured on several levels:

- **For the consumer:** an increase in product quality, validated by higher ratings during customer panel tastings.
- **Economic:** significant productivity gains directly linked to data utilization. These gains translate into improved material efficiency (more finished product from the same amount of milk) and energy optimization, two major drivers of competitiveness.
- **Managerial:** improved access to data and information has streamlined internal communication and accelerated decision-making.
- **Human:** The project has made the profession more attractive to younger generations, who see it as a logical extension of their digital world.



Didier Vigier
Process
Manager

«This has enabled field operators **to make decisions more quickly** and to modernize our image in order to be more attractive for younger generations.»

«On the operator stations, operators have tablets with dashboards and real-time control cards. So they can track their settings and it allows them to avoid oversetting or inappropriate adjustments. We **have greatly improved our variabilities** and the trends in our processes.»

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6 Sigma

in the Food Industry

In the food industry, the Six Sigma approach provides a powerful framework for process control. It does not replace existing standards such as HACCP or ISO 22000; instead, it strengthens them by using statistical tools to reduce variability and manage performance proactively. The goal is simple: to ensure that every product meets consumer expectations, every time, at the lowest possible cost. Six Sigma relies on extensive use of data and tools to support the teams responsible. Digitalization and analytics tools are true catalysts for this approach.

The backbone of Six Sigma is the DMAIC improvement cycle:

D	Define
M	Measure
A	Analyze
I	Improve
C	Control

To illustrate the approach, let's take the example of a cookie factory facing issues with variability in the weight of its cookies, leading to material waste and regulatory non-compliance.

Define

M

A

I

C

The goal is to define the scope of the project. The team identifies the problem, the objectives, the scope, and the expected benefits.

Problem: Cookie weight coming out of the oven is inconsistent. 10% of batches fall outside legal specifications (underweight) or economic specifications (excessively overweight).

Objective: Reduce non-compliance in cookie weight to less than 1% within 6 months.

D Measure A I C

This phase involves quantifying the process's current performance to establish a baseline. The key is to collect reliable data.

Action: The team implements a data collection plan. The weight of hundreds of cookies is measured as they come out of the oven at different times of the day. Key process parameters (oven temperature, conveyor belt speed, dough viscosity) are also recorded.

Result: The data shows high variability (a high standard deviation) and a mean shifted away from the target weight. The current process capability (Cpk) is calculated and deemed highly insufficient.

Tools: control charts, process capability analysis.



SPC Analysis

Bringing processes under control using a 6 Sigma or SPC approach. An analysis workflow that determines process capability and establishes control limits and alert rules for key process parameters.*

D M Analyze I C

The team analyzes the collected data to identify the root causes of variability.

Action: Using appropriate analysis tools, the team looks for correlations between weight variations and process parameters.

Finding: The analysis reveals two main causes: temperature fluctuations in zone 2 of the oven and a variation in dough viscosity, which is itself linked to kneading time.

Tools: influence analysis, cause-and-effect diagram (Ishikawa), 5 Whys.



Influence Analysis

Understanding and optimizing a production process. Analysis workflow to identify parameters influencing performance and determine their optimal settings.

D M A Improve C

The goal is to identify, test, and implement solutions to eliminate root causes.

Solutions:

- Installation of a more efficient temperature control system in zone 2 of the oven.
- Standardization of kneading time and implementation of dough viscosity control prior to forming.

Action: A design of experiments (DOE) is carried out to determine the optimal settings for the oven and the mixer. The solutions are then implemented on the production line.

Tools: Design of Experiments (DOE), pilot tests, influence analysis.

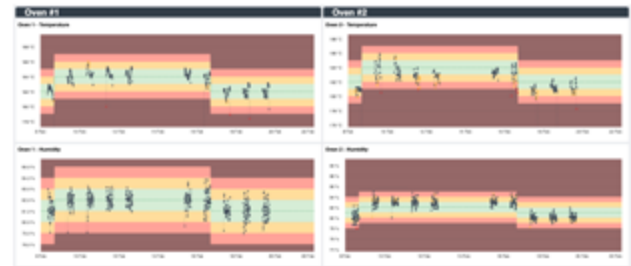
D M A I Control

The final phase aims to ensure the sustainability of the improvements achieved. It is essential to ensure that the process remains stable and under control in the long term.

Action: The new procedures (kneading time, temperature settings) are formalized, and operators are trained. Control charts are deployed on the line, allowing operators to monitor cookie weight in real time and react immediately in case of deviations.

Result: The process is stabilized at a high performance level. The gains (reduction in material losses, customer satisfaction) are tracked and documented.

Tools: control plan, control charts (SPC), alerts, standardization of procedures, training



Control Charts

Automated management and implementation of controls and alerts for key process parameters.

In conclusion, Six Sigma is a management strategy that, when rigorously applied, effectively led, and supported by the right digital tools, enables the food industry to transform its production challenges into a sustainable competitive advantage.

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536 rue Costa de Beauregard
73000 Chambéry - France