SIEMENS

EBOOK

Process optimization in the Dairy Industry

Boost efficiency and quality in production processes to meet market demand

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The challenges
of today’s Dairy Industry

Whether big or small – all companies
in the dairy industry face similar challenges:

Rising quality requirements

Consumers and regulatory bodies
demand the highest standards.

Cost and efficiency pressure

Energy, raw materials, and personnel
are becoming more expensive.

Rapid market changes

New products and evolving
consumer preferences require agility.

How can you minimize downtime, streamline processes for greater flexibility and efficiency, and ultimately drive digital transformation to enhance overall quality and productivity?

Precision for powder production

Spray dryer optimization

The critical phase of spray drying directly impacts product moisture content, overall quality, and shelf life, all within an environment of evolving market demands.

The Solution

Digital Twin for process simulation

Configuration and calibration of a physics-based digital twin to accurately model process behavior.

Deployment as a soft sensor

Utilizing the digital twin in your Advanced Process Control (APC) system, supported by a decentralized edge computing platform.

Real-time optimization and control

Continuous monitoring and control of spray dryer performance.

Energy reduction

Reduce energy consumption by up to 10%[1].

Precise moisture determination

Exact determination of product moisture content.

Variability reduction

Decrease product moisture variability by 30%[1].

[1] Compared to previously employed data-driven APC at the factory.

Recipe control and transparency

Flexible batch production

Easily and quickly adapting your production to new requirements while maintaining full control and transparency over batch processes is the key in today's dairy industry but comes with challenges like managing increasing demand for high-mix/ low-volume production, ensuring consistent quality and comprehensive traceability, and navigating the need for specialized knowledge and stringent documentation for recipe adaptation.

The Solution

Out-of-the-box process control system

A ready-to-use solution specifically designed for the demands of batch production.

Integrated recipe editor

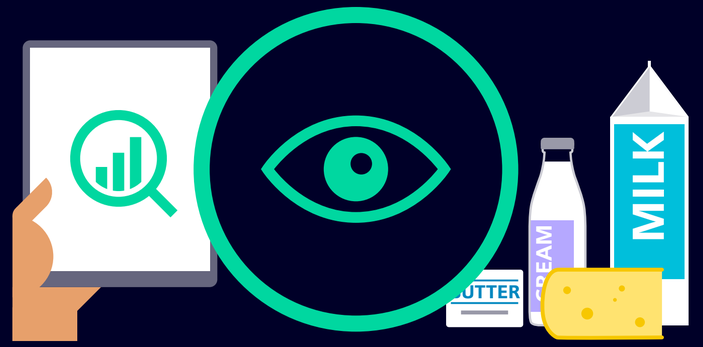
Enables easy creation, adaptation, and supervision of recipe execution.

Batch reports and material tracking

Detailed reports for each produced batch and seamless tracking of materials and final products.

Rapid product adaptation

Effortless adaptation of existing products and quick introduction of new ones without PLC program changes.



Full transparency

Comprehensive transparency at all times regarding production efficiency and all produced batches.

Consistent quality

All process-relevant information is available at a glance, ensuring correct execution and consistent quality.

Optimized Cleaning-in-Place (CIP) processes

Maximizing efficiency, ensuring quality

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The Solution

Real-time CIP monitoring

A system providing comprehensive, real-time visibility into all critical CIP parameters.

Guided optimization framework

Empowering operators with actionable insights to refine resource consumption (water, temperature, electricity, chemicals, time) while safeguarding cleaning effectiveness.

Industrial edge integration

Leveraging an Industrial Edge-based solution for system independence from existing automation infrastructure and future scalability, including AI-driven optimization capabilities.

Measurable sustainability impact

Quantifying reductions in resource consumption to align with and achieve corporate sustainability objectives.

Operational agility

Ensuring seamless integration and broad compatibility with diverse customer automation systems through flexible Industrial Edge connectivity.

Optimized resource utilization

Driving significant reductions in water, energy, and chemical consumption without compromising product quality or safety.

Proactive and intelligent maintenance

Predictive maintenance in production

Downtime is expensive and can compromise product quality. An intelligent maintenance strategy is key to optimizing your assets and preventing unexpected problems. Modern maintenance operations are often hampered by siloed solutions that necessitate manual asset onboarding and scatter critical data across disparate systems. This fragmentation leads to significant knowledge gaps, hinders collaboration, and often results in hesitant adoption of new, more efficient technologies.

The Solution

Cloud-based maintenance service

A Software-as-a-Service (SaaS) solution specifically designed for predictive maintenance.

AI-driven learning

Utilizes Artificial Intelligence to automatically learn from machine and maintainer behavior.

Asset and sensor agnostic

Works with all types of assets and sensors and leverages existing data and infrastructure.

Rapid ROI

Return on investment in less than 12 months.

Reduced unplanned downtime

Up to 50% reduction in unplanned downtime.

Reduced maintenance costs

Up to 40% reduction in maintenance costs.

Unlock Your Full Potential: Integrated solutions for future-ready dairy production

Connect your processes, elevate your quality, and drive sustainable growth.

Ready to transform your dairy operations?

The true power of process optimization emerges when individual solutions work together seamlessly. By integrating advanced technologies, you can transform your dairy operations into a highly efficient, agile, and resilient enterprise, perfectly suited for the dynamic markets.

Holistic efficiency

Combine precise spray dryer optimization with flexible recipe control to ensure consistent product quality, reduce energy consumption, and rapidly adapt to evolving market demands.

Maximized uptime

Leverage predictive maintenance across your assets to minimize unplanned downtime, extend equipment lifespan, and ensure continuous, reliable production.

Data-driven decisions

Transform operational data into actionable insights, enabling smarter decisions that optimize every aspect of your value chain – from raw material to finished product.

Scalable growth

Implement solutions designed to grow with your business, supporting expansion and increasing capacity across the region with confidence.

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Support: Please direct any questions in connection with this White Paper to your Siemens contact person at your representative/ sales office.

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