



so|ecta
An Acuriant Brand

Helping Dairy Processors Improve Membrane Performance

A practical guide to increasing yield, reducing operating costs,
and making better replacement element decisions.

Where membrane performance creates value

Every dairy processor works to maximize yield recovery while keeping production running safely, efficiently, and consistently. Over time, however, membrane performance naturally changes. Small shifts in retention, fouling, and cleaning efficiency develop gradually, making them difficult to distinguish from normal process variation.

Those changes rarely create an immediate operational issue. Instead, they quietly reduce yield, increase cleaning frequency, consume more energy and chemistry, and add variability to production. By the time the impact appears in operating costs or financial results, valuable recovery opportunities may have already been missed.

Membrane separation plays a critical role in producing high-value dairy ingredients, including whey and milk protein concentrates, isolates, lactose, milk powders, and reclaimed process water. Improving membrane performance helps protect each of those value streams while supporting more consistent plant performance.



SIX VALUE GAPS



Yield

Product recovered per pound of milk solids processed



Uptime

Hours of production protected from unplanned interruption



Operating cost

Chemistry, energy, and labor reduced per production day



Sustainability

Water, energy, and waste reduced across the membrane life



Capacity

Throughput recovered without capital expansion



Product

Specification consistency that protects premium grades

What we're hearing from the plant floor

"Nothing's broken.
We're just not getting the
performance we used to."

PROCESS ENGINEER

"Costs are climbing.
Volume is flat."

PLANT MANAGER

"The costs show up long after the
performance changes."

CFO

"The element isn't the expensive part.
It's the downtime, schedule changes,
and lost production that follow."

MAINTENANCE MANAGER

The purchase price is only part of the equation

The purchase price of an element is only one part of its overall economic impact. Over its operating life, membrane performance influences yield recovery, production uptime, cleaning requirements, energy use, labor, and product consistency.

Even relatively small changes in membrane performance can create costs that far exceed the price of the replacement element itself. Because those costs accumulate gradually, they often become accepted as part of normal operations rather than recognized as opportunities for improvement.

Looking beyond purchase price helps processors make replacement decisions that improve long-term operating performance instead of simply managing equipment costs.

TOTAL COST OF OWNERSHIP

10% PURCHASE PRICE

90% EVERYTHING ELSE

- Yield loss
- Quality downgrades
- Energy
- Chemistry
- Reactive labor
- Downtime

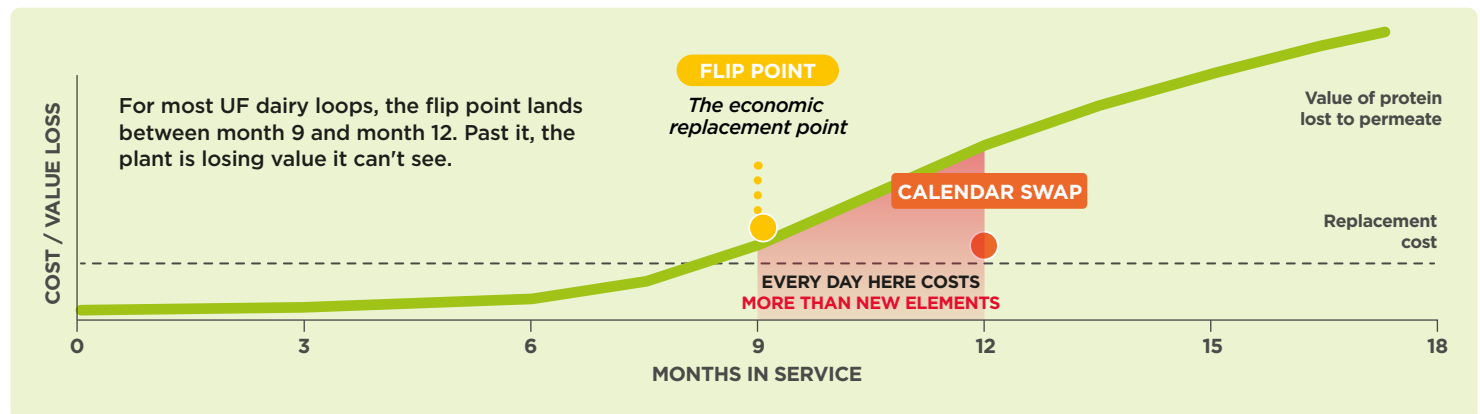
PROCUREMENT NEGOTIATES THE 10%.
OPERATIONS PAYS THE 90%.

Find your flip point

Every element reaches a point where it costs more to operate than to replace. We call this the flip point.

Replacing too early can leave useful element life on the table. Waiting too long can gradually reduce recovery, increase cleaning requirements, and lower overall process efficiency. The challenge is that this transition rarely happens all at once. Performance changes slowly, making it difficult to recognize exactly when the economics have shifted.

Understanding that point allows replacement decisions to be based on operating performance rather than assumptions or fixed schedules.



Three Replacement Decisions

Reactive

Replacement happens after an unexpected performance issue disrupts production. Unplanned downtime, expedited freight, and schedule changes often become the most expensive part of the event.

Calendar-based

Replacing elements on a planned schedule provides consistency and simplifies maintenance planning. However, element performance doesn't always follow the calendar. Some elements continue delivering strong value well beyond their scheduled replacement, while others begin affecting yield and operating costs much sooner.

Performance-based

Operating data provides a clearer picture of how elements are performing over time. Replacement decisions are based on the point where declining performance begins costing more than a new element, helping maximize both membrane life and operational value.

Every membrane process reaches a point where performance begins to cost more than replacement. The challenge is knowing exactly when.

Turn operating data into better membrane decisions

With SolectaINSIGHTS

Every dairy plant generates valuable operating data. Most of it is used to keep production running safely and efficiently. SolectaINSIGHTS helps you use that same information to better understand membrane performance, identify gradual changes before they become costly, and make more informed optimization and replacement decisions.

Using the operating data you already collect, SolectaINSIGHTS establishes a performance baseline for each membrane process and tracks how that performance changes over time. Rather than relying solely on fixed replacement schedules or isolated performance indicators, it provides a clearer picture of how membrane performance is affecting yield recovery, operating costs, and Total Value of Operation (TVO).

The result is practical, data-driven guidance that helps improve membrane performance, recover more value from existing operations, and identify the right time for element replacement.

HOW IT WORKS

- 1 **Share your data**
Provide approximately three months of historical operating data, including flow rates, pressures, CIP history, and permeate analysis, to establish a reliable performance baseline.
- 2 **Understand membrane performance**
Receive a detailed analysis showing performance trends, yield recovery, opportunities for improvement, and the economic replacement point for each membrane process.
- 3 **Improve operational results**
Use ongoing monthly analysis to support better membrane decisions, improve yield recovery, reduce operating costs, and monitor performance over time.



Two ways we help

01

Optimize existing membrane performance

In many plants, the greatest opportunity isn't replacing elements. It's improving the performance of the elements already in service. By analyzing operating data, we help identify opportunities to improve yield recovery, stabilize membrane performance, reduce cleaning burden, and maximize the value of your existing membrane processes before replacement becomes necessary.

02

Replace at the right time

When element replacement becomes the right economic decision, timing matters just as much as membrane selection. Using performance data and application expertise, we help identify the economic replacement point and recommend membrane solutions engineered for your specific dairy application, helping maximize long-term operational performance.

The value we deliver

Proven performance across 500+ dairy processor installations worldwide.

5 - 15%

PROTEIN YIELD

Increase in protein yield, translating directly to revenue per unit of feed processed

10 - 20%

PRODUCTION UPTIME

Increase in production uptime through stabilized operating ranges and reduced cleaning burden

20 - 25%

CIP WATER AND CHEMISTRY

Reductions in CIP water and cleaning chemistry usage, lowering both operating cost and environmental footprint

CLIENT SUCCESS STORY

5.76% increase in protein yield. Plant-wide adoption within one quarter.

A Wisconsin cheese processor wanted to understand whether membrane performance could improve protein recovery without disrupting production. The plant installed Solecta PV0.3M microfiltration elements on one of three parallel whey microfiltration trains processing feed to a WPI ultrafiltration system and compared performance against two incumbent membranes.

Over the course of one quarter, the Solecta train delivered a 5.76% increase in protein yield, recovering an additional 16.2 pounds of protein per hour. Based on current protein prices of \$14 per pound, the membrane investment paid for itself in approximately 10 days.

Following the evaluation, the processor expanded PV0.3M across all three MF trains, replacing its calendar-based replacement strategy and recovering approximately 292,000 additional pounds of protein annually.

+5.76 %

PROTEIN YIELD

~292,000 lb/yr

ADDITIONAL PROTEIN

~10 days

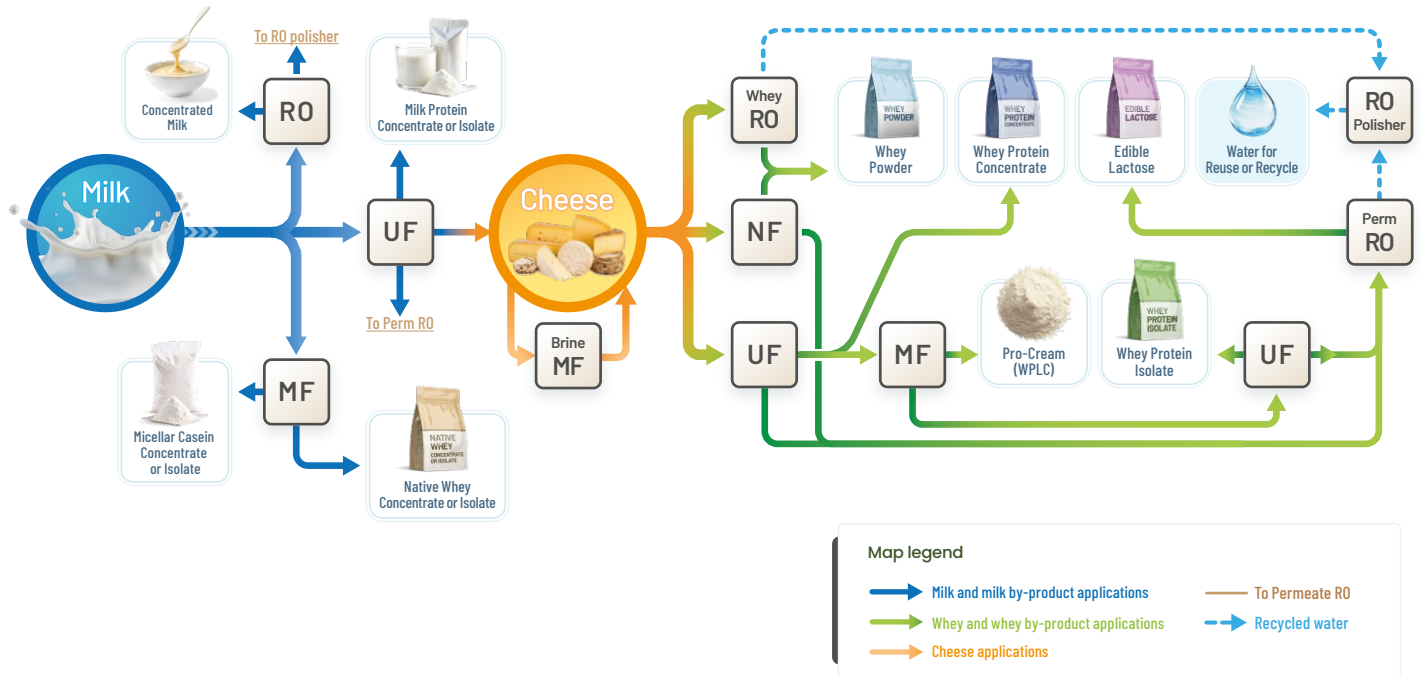
ELEMENT PAYBACK



See if SolectaINSIGHTS fits your operation →

Supporting better membrane performance across the dairy process

Solecta manufactures the full polymeric membrane portfolio used in dairy separation, spanning microfiltration, ultrafiltration, nanofiltration, and reverse osmosis. Every element in the portfolio is engineered specifically for the product chemistry, fouling profiles, and yield demands of dairy processing.



DAIRY APPLICATIONS

APPLICATION	TECH	WHAT IT DOES	VALUE CREATED	ELEMENT
Whey protein concentration	UF	Concentrates whey protein into WPC and WPI streams	Protein captured per pound of whey processed	PE10K, PE5K, PE5K HC
Whey defatting	MF	Removes residual fat upstream of UF	Cleaner protein stream · Higher WPI grades Lower UF fouling	PV0.3M
Milk protein separation	MF	Separates fat from skim for protein standardization	Consistent protein-to-fat ratios Extended shelf life	PV0.3M
Lactose concentration	NF	Concentrates lactose from UF permeate for powder and demineralized streams	Recovered lactose value · Lower evaporator load	NF300
Cheese brine clarification	MF	Removes bacteria, yeast and mold from cheese brine	Brine reuse · Extended brine life Lower disposal cost	PV0.1M
RO water recovery	RO	Reclaims water from process streams for plant reuse	Water cost reduction Lower effluent discharge volume	ROPlus

Built to dairy-grade compliance standards

Every Solecta polymeric element used in dairy applications is manufactured to meet FDA CFR Title 21 requirements for food contact materials and EU Regulation EC 1935/2004 for materials intended to come into contact with food. Full documentation is available upon request.

A partner focused on better membrane performance

Every dairy operation is different. Feedstock, production schedules, cleaning practices, and operating conditions all influence how membrane performance changes over time.

Our application engineers have spent years working alongside dairy processors to improve yield recovery, troubleshoot fouling challenges, optimize cleaning strategies, and evaluate membrane performance using real operating data. We understand that every replacement decision affects production schedules, operating costs, and the teams responsible for keeping the plant running.

That's why every engagement begins by understanding your process, your operating data, and your operational goals. Whether the opportunity is improving existing membrane performance or identifying the right time for replacement, we work alongside your team to help make better membrane decisions because better membrane performance starts with better decisions.



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Where to go next

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Explore dairy applications and client outcomes



solecta.com/industries/membrane-solutions-for-dairy/

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See if SolectaINSIGHTS fits your operation



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Trusted by OEMs. Proven with processors.



SEE WHY PROCESSORS CHOOSE SOLECTA

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TALK TO US

+1-760-630-9643

EMAIL

info@acuriant.com