



Got Water? How Water Reuse Strengthens Industrial Dairy Operations

Water is a critical resource for dairy production, flowing through each step of the process.

Estimates show that a gallon of milk takes 4.5–5 gallons of water to produce¹. However, this discounts the footprint created by the indirect water usage needed to maintain operations, further pronounced in facilities that process large quantities of milk into products like cheese and yogurt². Dairy processing wastewater also requires intensive treatment, typically through some combination of screening, dissolved air flotation, anaerobic digestion, and membrane filtration. Because many facilities lack the internal capacity for this level of treatment, much of their effluent is only being used once before returning to municipal streams. This practice accrues significant costs and water usage as facilities grow.

Many dairy plants we speak to share that water and wastewater management are interrupting daily operations and affecting their bottom line. Inefficient treatment systems, tighter discharge limits, and scaling demand create challenges that cannot be solved through their existing processes. Forward-thinking producers in this space are now turning to water reuse as a strategic advantage with economic, operational, and regulatory benefits.

Applications for Water Reuse in Dairy

Heavy water usage in dairy production is unavoidable. The vast majority of it is used before the cows have produced any milk³, and much of what remains will be evaporated when refining it into its final form. However, with the right systems in place, the water used in processing facilities can be captured, treated, and re-used internally instead of sending it down the drain.

A common example is the large-scale reuse of Condensate of Whey, otherwise aptly known as COW water. COW water, the result of evaporating milk or whey to create processed dairy from skim milk to protein powder, is one of the most common byproducts in the dairy industry. It requires complex treatment and dilution just to achieve the lowest acceptable standard of water quality under the Federal Grade "A" Pasteurized Milk Ordinance (PMO)⁴. Many facilities avoid treating it themselves, instead opting to send it out as wastewater to their municipality and racking up high sewer costs that grow as they scale.

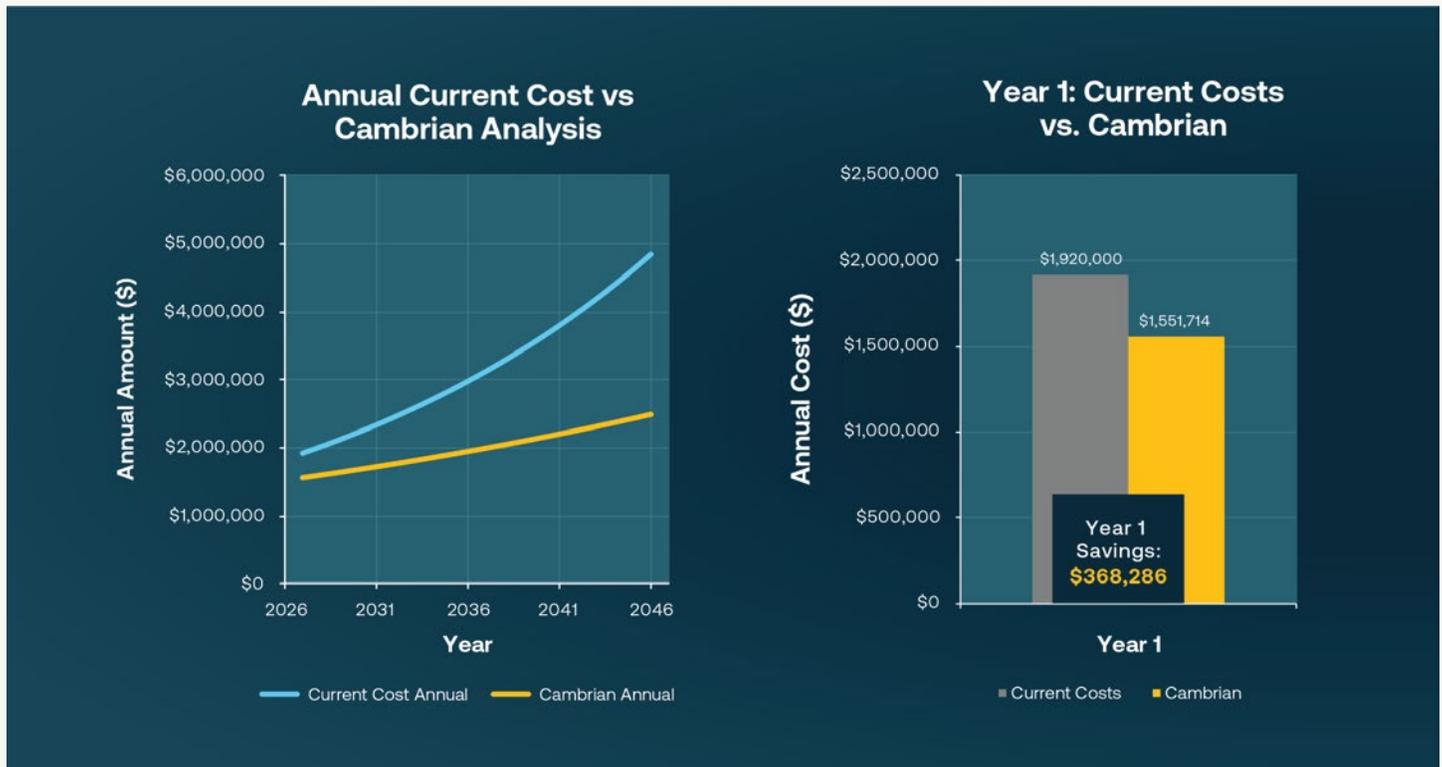
COW water, when treated efficiently, can be reused in a number of ways within dairy production. Depending on the PMO category achieved through pre-treatment, it can be fed into boilers, used for cooling, or passed through machines during Clean-In-Place or other sanitization processes. Each of these applications offers an avenue to save on water costs and reduce the facility's overall footprint. From there, additional technology can be used, such as to harness the biogas produced through anaerobic treatment processes, to provide further returns on a previously single-use resource.

Benefits of Water Reuse in Dairy

The economic benefits of implementing water reuse practices are straightforward. Each gallon of water pulled from municipal streams represents an opportunity to recapture the initial value paid at the tap.

As water scarcity continues to grow throughout the US, dairy producers are facing both price hikes and limitations to water access. Sudden changes to production capacity are major hurdles when looking to meet growing demand of the industry. Implementing robust water reuse systems immediately cuts a facility's water footprint, allowing them to reduce their overall water costs and stay prepared for the fluctuating pricing and availability of water that will mark the coming decades. One example of the cost-savings generated from water reuse practices can be seen in a midwest dairy co-op who partnered with Cambrian to solve for their increasing water costs.

The site was facing fluctuations in wastewater treatment surcharges, which inhibited their access to the capital needed for critical infrastructure upgrades. Now, Cambrian is stepping in to provide a new system that will help meet their existing pretreatment requirements while saving them over \$24,000,000 across the lifetime of the contract, ensuring business continuity for years to come.



Cost Savings - Cambrian vs. Business as Usual, 20-Year & Year 1 Savings - Data provided by facility and may vary

Beyond cost savings, regulatory scrutiny is also a common hindrance for facilities that rely on their municipality to handle wastewater. New pre-treatment requirements or changing standards for certain effluent characteristics can pose major challenges for facilities that lack the capacity to upgrade their existing systems. Unforeseen operational expenses of this size are often out of reach for many mid-size dairy producers, freezing their ability to grow.

Take, for example, a large dairy producer who recently partnered with Cambrian to solve their effluent discharge challenges. The site produces a significant amount of wastewater, and historically used land application to deal with the by-products of their manufacturing. When their local government told them they had to find a new method of disposal, they needed an innovative approach that could be implemented quickly to avoid shutting down. Cambrian stepped in to provide an anaerobic waste water treatment system which:

- *Improves their effluent water quality to meet standards for industrial reuse*
- *Allows them to stay in compliance and avoid major hindrances to production volume*
- *Generates additional revenue by harnessing and selling the biogas produced in reactors*

How Well is Your Water Management Strategy Working?

As you evaluate your wastewater management strategy, consider these questions:

- *How do water restrictions or rate increases impact your ability to meet demand for cheese, yogurt, or other dairy products?*
- *What challenges have you faced with municipal surcharges or discharge limits as your dairy production scales?*
- *Are you confident your current system will keep up with new regulations or demand?*
- *How would your team benefit if you could eliminate the headaches of water compliance and focus on production?*

How Cambrian Helps

Through our Water Energy Purchase Agreement (WEPA) model, we help industrial facilities across the dairy industry implement innovative water reuse practices and future-proof their business via two methods:

1. We design, build, own, and operate your treatment system with no capital investment. Enjoy immediate savings, paying only for performance on a per-gallon basis.
2. We purchase and replace a facility's existing water treatment system. Cambrian takes on the operational, regulatory, and economic burden of managing wastewater while providing predictable water rates often lower than their local municipality.

Let's Talk

Whether you're exploring a new operational model or looking to upgrade without the capital outlay, Cambrian is ready to partner for long-term success.

Your facility holds untapped value. Let's milk your wastewater for all it's worth.

Schedule a conversation with Cambrian: www.cambrianinnovation.com/contact