

DAIRY INDUSTRY



The **dairy processing industry** is highly diversified, and manufacturing operations create different qualities and quantities of waste that need to be treated.



Fluence offers alternatives to traditional wastewater treatment and provides world-class, innovative, economically attractive, and sustainable solutions for enhancing by-products.

Our advanced solutions for wastewater treatment, processing and product recovery enable clients to reduce water usage, wastewater, sludge disposal, and operating costs.

Anaerobic Treatment

With 30 years of experience in biogas production technologies, Fluence has performed a series of pilot tests confirming the benefits of anaerobic treatment to generate biogas with a very high yield index.

Anaerobic digestion is suited for by-products of the whey utilization processes, such as mother liquor or salts after demineralization, or for the residues of other cheese-making processes, such as scotta and/or buttermilk. Fluence applies anaerobic digestion to whey by-products to maximize the dairy farm's output.

The dairy by-product first undergoes anaerobic fermentation. Once it has been digested, the digestate is separated into solid and liquid phases. The solid part of the digestate, which has a much lower volume than the influent, is safely reused in agriculture or turned into compost. The liquid part is sent for additional treatment to the existing wastewater plant, which may need upgrading to handle the higher load, or transferred to the local municipal wastewater plant through the sewerage system.

Using anaerobic digestion to obtain biogas and biomethane maximizes energy efficiency growth and develops a sustainable model for the dairy farm economy. Anaerobic digestion produces not only biogas, but also digestate, an excellent source of organic fertilizer and can be substituted for additional mineral fertilizers, reducing greenhouse gas emissions.

Whey demineralization

In addition to proteins, whey contains lactose and mineral salts, which can be recovered and converted into more valuable substances such as baby food ingredients. The demineralization process involves ionic exchange resins and preserves the lactose and proteins by reducing the mineral load by 90%.

Demineralized whey, crystalized and dried, is widely used as a raw material for various food products and is also used in the pharmaceutical industry.



Electrodialysis & Ion Exchange from Whey to DEMI70 & DEMI90

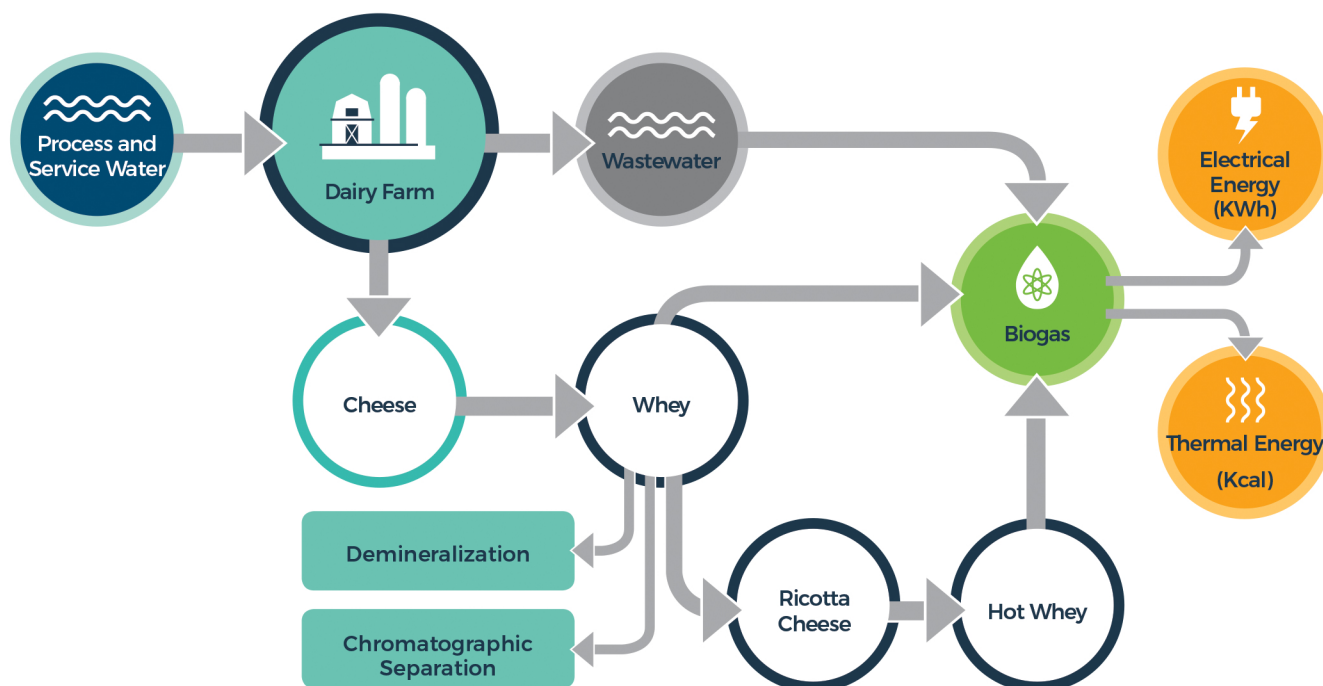
Fluence combines electrodialysis and Ion Exchange processes to remove only the ionized substances, leaving other valuable materials; optimizing energy and chemicals consumption and minimizing the loss of valued product and resulting in an optimal demineralized whey quality.

4SMB Chromatographic Separation of Whey Permeate

Using chromatographic separation technology, it's possible to remove 92% of the initial salinity in just one passage, reducing mother liquor production and lactose losses.

To obtain lactose powder, the whey permeate is subject to the following process:

- De-ashing through the 4SMB (Four Simulated Moving Bed) chromatographic system to separate lactose in whey from other components
- Crystallization for the development of lactose crystals



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