

Zero-water dairy plants save vital resources

Rather than simply purify water through RO for cleaning and other non product-contact operations, GEA has extended the processing capability to produce water, that can be used within the product.



Reverse Osmosis plant from GEA.

According to UN-Water, nearly half the world's population is already living in water-scarce areas and, by 2030, up to 700 million people could be displaced by intense water scarcity. Meanwhile the World Health Organization (WHO) says that there are approximately 1.1 billion people in the world who do not have access to clean drinking water. Such statistics are sobering, and it is clearly incumbent upon the industry to limit water use wherever possible.

The rise of the zero-water plant

The agricultural sector accounts for 70% of global water usage, so it is here that the greatest potential savings can be made. In this respect, the dairy industry has done its share with companies worldwide investing heavily in water-saving technology. But now there is a trend that takes the whole process to its ultimate limit. The technology to re-process water, not just for reuse in the factory but for use in product-contact operations, is here. Dairy plants that use no water

at all are fast becoming the norm. Large dairy factories that have such zero-water plants have reported huge water savings with water recovery plants having the capacity to provide between 800 m³ and 5,000 m³ of recovered water a day. But the latest technology can do much more than simply recycle water. With the right treatment water can be re-used for product-contact operations and even within the product itself.

GEA purifies water through Reverse Osmosis (RO)

Rather than simply purify water through RO for cleaning and other non product-contact operations, GEA has now extended the processing to produce water, that can be used within the product. This, according to Mark Braun of GEA in Hudson, Wisconsin, requires a totally different approach. Mark explained that there is an additional carbon treatment

About GEA

GEA is one of the world's largest suppliers for the food processing industry and a wide range of other industries that generated consolidated revenues of approximately EUR 4.6 billion in 2017. The international technology group focuses on process technology, components and sustainable energy solutions for sophisticated production processes in various end-user markets. The group generates around 70 percent of its revenue in the food and beverages sector that enjoys long-term sustainable growth. As of December 31, 2017, the company employed almost 18,000 people worldwide. GEA is a market and technology leader in its business areas. The company is listed on the German MDAX (G1A, WKN 660 200). In addition, GEA's stock is included in the MSCI Global Sustainability Indexes. Further information is available on the Internet at www.gea.com.

process, necessary to remove unwanted odours, UV treatment and both ClO₂ (Chlorine Dioxide) and mineral dosing to make the water less aggressive to the plant. But as well as these extra processes, the design of the plant needs to be completely different.

- If the recovered water is to come into contact with the product we have to treat it in a hygienic manner. Our system has a hygienic design with hygienic tanks and piping. In fact we treat the water in the same way that we would treat the finished product, said Mark Braun. Water treated in this way can be purified to meet WHO standards for potable water and therefore be used in a wide variety of operations such as for final flushing, rinsing of cans, cleaning of tanks and pipework, and even as an ingredient in the finished product. This was never required in the past.

Even with this additional processing, there is still some water that cannot be reprocessed to the required standard. This small residue is frequently used in

plants for watering gardens or flushing toilets; water that would otherwise have been supplied by the water utilities.

Dairy processors set a good example

It is feasible, from a technology and engineering perspective, that all new dairy plants will be able to derive all their water from the milk they process. As water resources are getting scarce, the dairy industry has been at the forefront of conservation efforts. Since the early 1990s, when the first membrane plants were installed to recover water from evaporator condensate and re-use it, the technology has become a common feature for all new installations. It has also facilitated the installation of large production facilities even in water-stressed areas such as the Western United States. While water re-use initiatives are being applied very successfully in the dairy sector the same technologies could be applied to other sectors of the food industry that require

Contact:

Preben Koenigsfeldt
GEA Process Engineering A/S
Phone/Mobile +459139 9343
Preben.Koenigsfeldt@gea.com
www.gea.com

high volumes of water for processing.

We all rely on water and, as the global population increases towards a predicted 9.5 billion people by 2050, its availability continues to diminish for many. In recent years this realization has focused the minds of dairy processors worldwide. Of course, many dairy processing plants are not in countries suffering from water stress, however operators still see the retention of water as good practice and essential to preserve this vital resource for future generations. For those in regions where water is already scarce, the motivation is more acute.

GEA

Membrane filtration for Dairy plants.

