CASE STUDY

September 2012

APV LeanCreme process from SPX helps MS Iceland Dairies put excess whey to highly profitable use

Benefits include an 8% increase in yield, a payback time of less than 2 years and a range of new, premium products.

MS Iceland Dairies is a nation-wide cooperative organisation including more than 700 family-run dairy farms and other milk producers that employs over 450 people in roles other than farming. With an intake of some 120,000 tonnes/yr of raw milk, the company produces 300 plus dairy-based products which are distributed to 3000 outlets around the country with a growing percentage exported to, principally, the USA and Finland. Products include whole, semi-skimmed, skimmed and UHT milk, chocolate milk, high-quality yoghurt based drinks, buttermilk, skyr (a thick, creamy but virtually fat-free yoghurt), butter, cream and cheese. At the organisation's ISO9001 certified Akureyri plant, which receives milk from over 200 producers, 65% is used to produce cheese resulting in a large quantity of whey. In 2007 the company faced the challenge of how to dispose of excess whey from the Akureyri plant, and being very environmentally aware, was reluctant to adopt the obvious solution of a waste treatment facility. Sigurdur Rúnar Fridjónsson, Plant Manager at MS Iceland Dairies explains, “Whilst looking for alternative ways to handle the excess whey, we contacted a number of companies and discussions with SPX revealed an innovative and attractive alternative solution, namely, the APV LeanCreme™ process from SPX. This would extract and treat the protein from the whey to produce a high-protein, low-fat dairy concentrate and a liquid residue that could be discharged without environmental impact. The LeanCreme™ concentrate would then be used to replace part of the fat in our premium cheese products without

compromising flavour or texture and also offered the potential of new high-protein products such as dairy-based sports drinks."

The APV LeanCreme™ system from SPX comprises an ultrafiltration stage, a microparticulation system and a reverse osmosis unit. The ultrafiltration stage concentrates whey from the cheese making plant to produce whey protein concentrate (WPC) that is the feed stock for the Microparticulation system at the heart of the LeanCreme™ process. Microparticulation is a thermal and mechanical treatment that denatures whey protein concentrate to form ideal protein particle sizes similar to fat globules in milk. By replicating the particle sizes of milk, the high-protein LeanCreme™ contributes to finished products the much-desired creamy mouth feel and texture of full-fat products, but with a reduced fat content.

Key to the performance of the LeanCreme™ process is the advanced APV Shear Agglomerator (ASA) that provides a tightly controlled one-step thermal and mechanical treatment of the WPC. ASA is a groundbreaking technology that combines simultaneous heat denaturation of the protein and the formation of micro-particles of protein under controlled high shear. The synergy between heat and shear brings a new functional dimension to whey protein concentrates. Compared with traditional two-step techniques, the technology offered by SPX delivers greatly superior results, in particular the creamy texture and mouth feel of a luxury end product.

LeanCreme™ is a totally natural product that can be used as an alternative to stabilizing additives. It is less expensive than skimmed milk concentrate and offers a lower fat percentage with high nutritional value yet better texture and feel. In cheese production it offers an increased yield of 6-10% with improved, premium quality results. Ultimately it results in healthier products with a luxury feel.

In the Akureyri plant, the installation includes an additional stage of treatment for the

residual permeate from the LeanCreme™ process. A reverse osmosis filtration stage further cleans the permeate which reduce the chemical oxygen demand for the waste water significantly.

The installation, which was commissioned in May 2007, was completed on schedule and with minimal disruption to the plant. This was achieved by delivering the three main modules already mechanically assembled and tested on skids in SPX Silkeborg, Denmark plant and requiring only connection to the storage tanks and plant services such as steam, water, electrical and control systems. The ultrafiltration, microparticulation and reverse osmosis modules each have fully integrated cleaning in place (CIP) systems and local control stations in hygienic sealed stainless-steel cabinets. The control panels permit local control of the process stages together with full remote control facilities, which are integrated into the plant wide control system.

The APV LeanCreme™ installation at the Akureyri plant was initially used as planned, to extract the protein from the whey and feed it back into the cheese milk to reduce effluent treatment requirements and improve yield. As well as the remarkable 85% reduction in COD mentioned earlier, the immediate benefits included a measured 8% increase in yield for the cheese making process with a significant impact on the business performance of the plant. The resulting payback time for the installation was well under two years.

More recently, MS Iceland Dairies has started to develop new products that appeal to the growing demand for reduced-fat dairy foods and drinks. These products typically lack the sensory qualities of full-fat products, but by using the APV LeanCreme™ microparticulated whey protein from SPX, the company has been able to produce fermented whey protein drinks with the desirable texture and feel of a full-fat dairy product. One product in particular has been highly successful and now represents the single biggest revenue earner created by the LeanCreme™ process. “HLEDSLA”

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(meaning recharge) at MS Iceland Dairies, “is a 10% protein, very low-fat dairy drink that appeals to sports persons, fitness enthusiasts and the growing percentage of the population looking to reduce fat intake for any one of a variety of reasons. HLEDSLA has sold well here in Iceland and is enjoying considerable commercial success in Finland as well”.

About SPX Flow Technology:

The SPX Flow Technology segment designs, manufactures and installs highly engineered solutions used to process, blend, meter and transport fluids, in addition to solutions for air and gas filtration and dehydration. The segment supports global food and beverage, dairy, pharmaceutical, oil and gas, energy, and industrial markets. SPX (NYSE: SPW) is a global Fortune 500 multi-industry manufacturing leader with over $5 billion in annual revenue, operations in more than 35 countries and over 18,000 employees. For more information, please visit www.spx.com.

About SPX:

Based in Charlotte, North Carolina, SPX Corporation (NYSE: SPW) is a global Fortune 500 multi-industry manufacturing leader with over $5 billion in annual revenue, operations in more than 35 countries and over 18,000 employees. The company’s highly-specialized, engineered products and technologies are concentrated in three areas: Flow Technology, infrastructure, and vehicle service solutions. Many of SPX’s innovative solutions are playing a role in helping to meet rising global demand for electricity, processed foods and beverages and vehicle services, particularly in emerging markets. The company’s products include food processing systems for the food and beverage industry, power transformers for utility companies, cooling systems for power plants; and diagnostic tools and equipment for the automotive industry. This description of SPX does not contemplate the pending sale of the Service Solutions business. For more information, please visit www.spx.com.

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PHOTO (S):

The SPX LeanCreme Plant

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Sigurdur Rúnar Fridjónsson (right), Plant Manager at MS Iceland Dairies and Asger Sommer Hansen, Project Sales Manager, SPX, presented the latest LeanCreme products on the SPX stand during Anuga FoodTech in Cologne 2012

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Skyr products from MS Iceland Dairies