

Cost and environmental benefits

SPX one step UHT system drives milk production efficiency in South Africa

In August 2013, SPX completed commissioning of an innovative one-step ultra-high temperature (UHT) process line at the Coega Dairy in Port Elizabeth. This highly efficient system provides significant cost and environmental benefits to the plant.

About Coega Dairy

The Coega Dairy near Port Elizabeth in South Africa has a focus on producing high quality, environmentally friendly milk. It supplies the supermarket giant Shoprite-Checkers with its private label product and supplies its own brand Coastal View into other channels. With a focus on obtaining best efficiency, the UHT processing plant claims to have the smallest carbon footprint of any dairy in the Southern hemisphere. Structured to maximise the positive economic impact in the area, Coega Dairy is co-owned by local farmers, workers and communities. The majority of shares are held by the Coega Dairy Milk Producers Organisation (CDMPO) whose shareholders are South African commercial dairy farmers from the Eastern Cape. The remaining shares belong to the Coega Empowerment Trust (CET), which incorporates Amadlelo Projects Trust (a black empowerment agribusiness), Coega Dairy Factory Workers Empowerment Trust, and Commercial Farmers Empowerment Trust.

APV one step UHT system selected for efficiency and SPX Expertise

In a recent expansion of the plant, Coega Dairy selected the SPX APV Enhanced UHT Sterilising Plant. This one-step tubular UHT solution offers savings in both energy and water compared with traditional plant

configurations, producing high quality milk with minimised environmental impact.

Victor Korsten, Chief Executive from Coega Dairy, commented, "We selected the SPX solution because of our previous experience with them and confidence in their dairy processing expertise. The technology offered in this UHT system fits with our drive to obtain and maintain best efficiency, provide competitive milk production and minimise our impact on the environment."

Delivered to the Coega plant in June 2013 and commissioned in August 2013, the system is the first SPX one step UHT process line installed in South Africa. It provides one step processing of fresh milk from raw milk silos into an aseptic tank in one continuous flow with a capacity of up to 18,000 litres per hour. The process includes pre-

heating, deaeration, skimming, fat standardisation, deaeration homogenisation, sterilisation and final cooling and transfer to an aseptic tank at filling temperature.

In line with Coega Dairy's vision to be the leading, world class, environmentally friendly dairy company in South Africa, the technology has exceptionally high utility recovery efficiency. 85 per cent heat recovery eliminates use of any cooling water required for filling temperature. Running times are extended without compromising on the quality of the milk by maintaining a high product velocity through the system to reduce the tendency for fouling. To maximise running time and increase overall plant productivity, the system also operates with a reduced temperature differential between the milk and the heating media. Corrugation of the inner tubes further contributes to high



The process includes pre-heating, deaeration, skimming, fat standardisation, deaeration homogenisation, sterilisation and final cooling and transfer to an aseptic tank at filling temperature



The one-step tubular UHT solution offers savings in both energy and water compared with traditional plant configurations at Coega Dairy (photographs: SPX)

heat transfer efficiency, reducing the required transfer surface area, installation footprint and dead volume within the plant.

The increased running time of the plant not only extends production capability but also reduces the amount of clean in place (CIP) cycles required. This lowers production costs and reduces the amount of product lost during the cleaning process.

The continuous, one-step process

Automatic control of the plant is through a PLC system. Raw milk enters a balance tank at a temperature of 5 °C from where it is pumped through the pre-heater to reach a temperature of approximately 55 °C. It then enters a separator where it is separated into skim milk and cream. Automatic fat standardization of the skim milk is then achieved using the APV Compomaster and the cream is fed into a cream processing system that has also been upgraded by SPX South Africa.

The next stage heats the standardized milk to around 75 °C before it is efficiently deaerated. A centrifugal extraction pump at the deaerator pumps the milk on to a homogenizer. The product is then heated to 90 to 95°C in a holding cell for a period of time to stabilise proteins and enable longer running times. A tubular heat exchanger then heats the milk to 139 °C. Temperature is guaranteed using a controller with temperature measurement at the inlet and outlet of the holding cell. The now sterile product is fed through a regenerative cooling section which reduces temperature to approximately 25 °C prior to filling or storage in an aseptic tank.

The total system is designed to provide very high efficiency and to make best use of recycled heat generated from the process to reduce utility usage.

Commenting about the project expertise offered by SPX, Korsten said, "The project management provided by SPX not only included their own system but incorporated the integration of additional modifications being carried out on site at the same time. The expert local support helped towards an on-time project for all involved parties."

Summary

Through its APV brand, SPX has long experience in the application of technology for the heat treatment of milk to enable longer shelf lives, fresher tastes and complete food safety. Compared with alternate technologies for the production of extended shelf life (ESL)/UHT milk, the SPX one step UHT plant requires less energy, has the potential for longer running times, a lower initial capital investment and a reduced overall installation footprint. The reduced CIP requirements minimises product losses and lowers overall operational costs.

This technology is an ideal solution for large dairy producers who require high volume processing lines dedicated to the production of white milk. It will help Coega Dairy maintain its impressive efficiencies and ensure economic, environmentally stable milk production in the region. The plant was successfully supplied and integrated using the detailed understanding and vast experience SPX has in serving the dairy industry. The system is working to the full satisfaction of the customer and sets a standard for combined quality and efficiency in milk processing. ▲

„Food Ingredients“ as new exhibition segment at Anuga FoodTec

Significance of functional ingredients in the production chain

The coming edition of Anuga FoodTec from 24th to 27th March 2015 in Cologne is positioning the theme „Food Ingredients“ as a new exhibition segment and is thus adding an important element for the production of food and beverages to its wide spectrum of exhibits. The focus here lies on functional ingredients. They change the consistency of products and are indispensable in the production process of numerous foodstuffs. The especially designed display area „Meeting Point - Food Ingredients“ is a communication and exchange hotspot. The suppliers of ingredients have the opportunity to participate here at attractive conditions or to present themselves individually in the immediate vicinity directly opposite the decisive target group of product developers and plant managers.

The „Meeting Point - Food Ingredients“ gives the theme ingredients a clear profile and a clearly visible positioning within the Anuga FoodTec, which thanks to its cross-industry concept covers all aspects of food production, from the processing through to the packaging. The Anuga FoodTec fair is therefore a must for decision-makers from all areas of production, both on a national and international basis.

For instance for production and plant managers, CEOs, commodity buyers as well as decision-makers from the research, development and marketing sectors. For the target group of product developers and plant managers, the suppliers of food ingredients are particularly important contact partners when it comes down to the optimisation of production processes. The suppliers of food ingredients can reach precisely this decisive target group at the fair much more efficiently than at other trade fairs.

The Anuga FoodTec is concentrating on the offer of ingredients, both spatially and in terms of contents, with its „Meeting Point - Food Ingredients“ concept. Interested companies can choose from a selection of different participation models: from individual solutions, to financially attractive „Smart & Easy Packages“, through to „Workstations“ for small budgets. The „Meeting Point“ concept also foresees a central stage for lectures, which participating companies can also make use of. Furthermore, innovative products can attract additional attention in the „New Product Zone“, a separate presentation area.

The attention-grabbing positioning of the „Meeting Point - Food Ingredients“ in the heart of the fair's activities offers a perfect platform for engaging in dialogues with users from the production and product development sectors.

Functional ingredients encompass additives for quality optimisation, process control, they are used to improve the structure and extend the shelf-life and include anti-oxidants, dyes, flavours, emulsifiers, fibres and stabilisers. The fact that Anuga FoodTec is focusing on their presentation clearly underlines their significance within the production chain.

Anuga FoodTec will host over 1,300 exhibitors from around 40 countries and approximately 43,000 industry experts from 131 countries. Anuga FoodTec is organised by Koelnmesse and the DLG (Deutsche Landwirtschafts-Gesellschaft – German Agricultural Society). ▲