

Arla Foods' new cutting-edge warehouse gives Göran Henriksson, logistics manager, something to smile about.





Jönköping, Sweden
One of Sweden's largest municipalities, Jönköping is home to about 121 000 people. Almost 10 000 registered companies operate in this thriving area.

Keeping it fresh

Getting Arla's dairy products onto the shop shelves

Few business sectors can rival the fresh food industry when it comes to the importance of speed and accuracy in logistics. Arla Foods Group, Europe's second largest dairy company, is using automation – including robotic order picking – to improve its logistics performance.

Arla Foods, formed in 2000 through the merger of the Danish company MD Foods and the Swedish firm Arla, is an international group producing exclusively milk-based products and enjoying a turnover of more than EUR 5.1 billion. A co-operative owned by some 10,600 milk producers, its main markets are Denmark, Sweden and – following the merger of its UK subsidiary with the British firm Express Dairies in 2003 – the UK. Besides these countries, which it considers its home markets, Arla Foods has other production facilities abroad, operates subsidiaries in another 19 key markets and exports goods to more than 100 countries worldwide. Faced with increasing price pressure from the multiple grocery chains – coupled with fluctuations resulting from Common Agricultural Policy reform – Arla has, in recent years, armed itself with a range of very strong brands. Household names such as Lurpak, Rosenborg, Anchor, Cravendale and

Buko are more resistant to price pressure, helping to boost Arla's sales of milk, cream, cheese, butter, fruit juice, yoghurt, milk powder and other milk-based ingredients.

Concentrating logistics

The merger between Arla and MD Foods in 2000 is indicative of the continuing trend towards concentration in the international retail sector and the European dairy sector in particular, and the company has since continued to centralize its operations. In Sweden, Arla's management decided to concentrate its logistics into just two main distribution centers (DCs) at Jönköping and Stockholm. This strategy resulted from the company's investigations, begun in the late 1990s, into how fresh dairy produce handling could be made more efficient. Arla's top executives visited several other dairies and similar distribution centers, some mechanical tests and simulations



in 2003 and the second planned for 2006. "We felt we couldn't gamble with the security of our deliveries," explains Göran Henriksson. "We wanted to see that the automation really met our requirements in terms of capacity and reliability before we committed ourselves to phase 2."

Short shelf lives

The Jönköping DC now has a footprint of some 12,000m² and serves a huge swathe of the middle of Sweden. Operating 24 hours a day and 7 days a week – except for the period from 2pm to 10pm on Saturdays – the DC delivers about 8,000 orders and 194,000 order lines per week to some 14,000 delivery points. Of the 590 SKUs handled at the site, at least 75% are fresh products with shelf lives under 30 days. This tough schedule is achieved by a combination of two quite different storage and picking systems. The first is a semi-automatic solution featuring automatic stacker cranes with satellite cars that serve manual order picking trucks with on-board displays. The second is Cimcorp's MultiPick, which combines buffer storage and order picking operations in one gantry robot-based, fully automated solution. Both systems operate in Jönköping DC's cold store temperature of 5°C.

Rapid and accurate picking

As well as distributing the products processed on site, the Jönköping DC receives goods from other Arla facilities and other manufacturers. Apart from some fast-movers which are delivered to Gothenburg dairy for distribution, all of these goods need to be picked according to customer orders and delivered to retailers as quickly as possible. Goods from Jönköping's own production as stacks of crates are transported to the robotic picking area via monorail conveyor. Whole roll-in containers from production are also

► followed and the decision was taken to automate the logistics processes of the Jönköping facility, as a test-bed for possible further automation.

"The objectives were clear: cost efficiency, delivery accuracy, improved working conditions and better space utilization," explains **Göran Henriksson**, Logistics Manager for Arla's Jönköping site. "We had only 2,900m² of cold storage space at the Jönköping site in 2001," continues Henriksson, "and that wasn't enough then, let alone accommodating our expansion plans for the facility. Arla wanted to move the whole of production from its Skövde site and 75% of production from the Linköping facility, as well as the distribution

of these goods and other special products, to Jönköping. The smaller sites had quite a lot of old equipment and were finding it increasingly difficult to cope with our ever-expanding product range. We needed a radical solution."

Phased automation

Arla decided to invest over EUR 16 million in the Jönköping site, extending the existing chilled stores, adding a new 8,000m² building and installing an automated handling system. The main contractor for the logistics solution was Swisslog, with the robotic handling system being developed and installed by Cimcorp. Arla planned to introduce the automation in two phases, the first going live

The main contractor's perspective

Pick magazine asked Tore Kemmer, Senior Logistics Consultant for main contractor Swisslog, about the challenges encountered during the Arla Jönköping project.

What were the most difficult issues at Jönköping?

"One of the biggest challenges resulted from the fact that Arla wanted to introduce the automation



in phases. This meant that we needed to design the sub-systems very carefully, in order to allow their expansion at a future date but also to ensure that both the initial installation and future upgrading could be carried out while the DC was still fully operational."

Did Arla have any specific requirements and how did you meet them?

"We had to think long and hard about the ergonomics of the semi-automated picking store. Having experienced a high level of staff injuries through heavy lifting in the past, Arla was understandably very keen to make its manual operations as ergonomic as possible. We spent a lot of time and effort perfecting the design of the pick faces to minimize the strain on Arla's staff. One of the major issues in any automated system is the handling of empty pallets and, here, we came up with a novel solution to this perennial problem. As



well as having a satellite car on board, each crane also has a set of forks, exclusively used for handling empty pallets. When a pallet at the pick face is emptied, a crane is called to retrieve it. The satellite car first retrieves the buffer pallet in front of the empty pallet. The crane then repositions to allow the double-deep forks to reach in and retrieve the empty pallet. The crane repositions again, allowing the satellite car to transfer the buffer pallet across to the pick face. With the satellite car on board again, the crane then goes to a deposit station to dispose of the empty pallet. This solution means that no-one has

to handle empty pallets, which are heavy and cumbersome.”

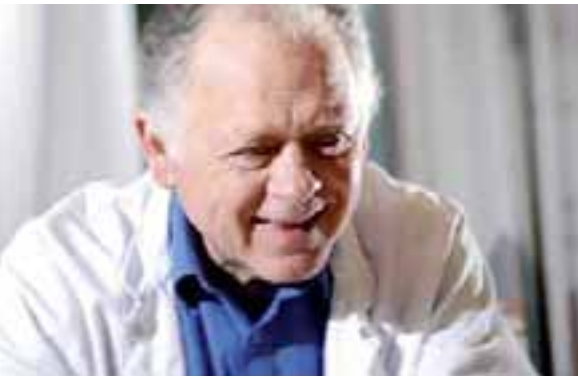
Why did Swisslog choose Cimcorp to supply the robotic handling system?

“Cimcorp was the natural choice for us. They had designed and implemented several MultiPick systems in similar applications and so could demonstrate that MultiPick was a proven product and very efficient at handling heavy crates. The alternative solutions that were presented to us were simply not competitive with Cimcorp’s MultiPick.”

TEXT: HEIDI SCOTT



PHOTO: TOMI GLAD



"Delivering the right goods in the right quantities is vital in order to maintain customer satisfaction."



► conveyed by monorail but to a special storage area where they are positioned on dolly conveyors in buffer lanes. Products received from elsewhere are registered on the warehouse management system (WMS) and then transferred by fork-lift truck, with palletized products and those in cardboard cases going to the semi-automatic picking system but stacks of crates and roll-in containers being delivered to the monorail for transport to the MultiPick and roll-in storage areas respectively.

In the automated store, 7 automatic stacker cranes operate to a height of 7 meters, serving 1,759 pallet positions along aisles 45m long. The racking is arranged double-deep and each crane features a satellite car to shuttle goods between itself and the pick faces, which are located in aisles between the racking modules. Here, goods are picked manually by operators working from low level order picking trucks, each of which features an on-board display and carries 4 roll-in containers for customer orders to be picked into.

The robotic store, which stores and picks crates, is served by 6 MultiPick robots mounted on 3 gantry frames. The robots collect stacks of crates delivered by the monorail system from the infeed points and transfer them to a free storage position on the floor. The robots then pick customer orders by lifting the required number of crates from a stack and transferring them to the outfeed conveyor, which transports them to dispatch. The minimum picking unit for the robots is

one crate; as the minimum delivery unit for customers is one row of products (gable-tops or Tetra Paks), there is also a manual picking area to complete these tasks.

These various operations – goods receipt, monorail transfer, pallet storage, picking in the semi-automated store via on-board displays, replenishment of the automated store, robotic crate picking, manual picking and roll-in container handling – are all supervised by the WMS, which controls the material flow and combines products in the dispatch area, ready for loading.

No room for error

"Our logistics needs are certainly complex," concedes Göran Henriksson. "We even have products that have different open-dates for different customers. Stock turnover is 1 day for 75% of our products – the milk and cream – and up to 5 days for the rest. Lead-times – from receipt of order to delivery with the customer – are 18–24 hours, although urgent orders to outlets close to the DC can be delivered in under 5 hours. Soon, the inventory will be in real-time for all products and that will help management considerably with decision-making."

"By concentrating our distribution at Jönköping," continues Henriksson, "we have certainly achieved economies of scale and our investment is paying dividends. The quality of the deliveries is a key factor for us. Delivering the right goods in the right quantities is vital in order to maintain customer satisfaction. In the dairy market, there's no

room for error, as the goods do not remain fresh for long. Today, our delivery accuracy is 97–98% and we're working towards our goal of 99%. Of course, accuracy figures are better in the MultiPick system, as there is no human error involved in that part of the solution."

Improved ergonomics

A major benefit resulting from the automation has been improved ergonomics for Arla's workforce. "Before automating our logistics, working conditions here were pretty tough," admits Henriksson. "People had to lift quite heavy loads and, as a result, there were significant health problems, especially shoulder injuries. Now the heavy loads are lifted by the MultiPick robots and the order picking in the semi-automatic store is much more ergonomic than in the past. The nature of the work is also more challenging and our staff definitely prefer it."

Having worked for Arla for over 30 years, Henriksson is experienced at introducing change and frank about its effects. "There will always be teething problems, but we think that we've made the right choice in automating our operations. For the management's part, we underestimated the time required for staff to learn the new routines necessary when working with automated equipment and the IT controlling it. We've had to implement additional training for both operational and maintenance staff but we're reaping the benefits of that now."

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