Energy-efficient fluid optimisation key as rising food prices put pressure on producers

Energy costs are an important aspect of operating expenditure in food production, given the range of thermal processes on which the sector relies, argues Ian Holland, Sales Manager at Armstrong Industrial, a division of Armstrong Fluid Technology.

Controlling costs in the food and beverage sector remains a key imperative alongside carbon emissions reduction, as many countries globally struggle to bring last year's food price increases in line with headline inflation.

Critical thermal processes contribute to energy making up 15-30% of food production costs; in terms of greenhouse gas emissions, food production is estimated to contribute about 26% of the global total.

"Food and beverage manufacturers have for many years been working to reduce carbon emissions while maintaining strict quality and cost targets," said Holland. "In this context, system optimisation is emerging as a critical strategic lever."

From thermal processing and cooling to water circulation and digital performance monitoring, he explained, engineering decisions now directly influence both sustainability outcomes and operational competitiveness. Common applications in the sector include pasteurisation, cooking, chilling, fermentation and cleaning - all areas where energy efficiency improvements can have measurable carbon impacts.

Precision and control

"Companies are looking for ways to improve their plants' use of energy and water, while giving operators greater visibility in terms of system performance," he said.

He highlighted that food and beverage production is heavily dependent on precisely controlled thermal processes, particularly in sectors such as brewing, dairy, beverages and packaged foods. These environments rely on tightly regulated water circulation systems for heating, cooling and hygiene assurance.

"Temperature control in these different applications is absolutely critical to the final quality of the product," he said. "Any deviation could lead to a whole batch of product needing to be reworked or even written off."

Sustainability and quality

Such risks translate directly into financial losses, reputational risk and increased resource consumption. Optimised pumping systems, accurate temperature control and integrated monitoring therefore serve both sustainability and quality objectives simultaneously. He noted that the food and beverage sector was already at a mature stage in terms of its sustainability goals.

"The large players in the industry are very much driven by sustainability outcomes, with shareholders and the general public wanting to see a steady reduction of their carbon footprint," he said. "To achieve this, they often include measurable environmental performance in their supplier contracts."

Leveraging Armstrong's experience in the food and beverage market, it is vital to understand the specific process context rather than supplying standardised equipment in isolation, Holland explained.

Optimisation

"By understanding the customer's process, a solution can be provided that exactly matches what they're trying to achieve - delivering the best efficiency and lowest carbon footprint," he said. "This may involve standardised product platforms, but the integration and optimisation strategy can be tailored to each facility's operational priorities."

While sustainability is an essential consideration in every project, cost competitiveness remains a decisive factor. Energy efficiency improvements typically translate into lower operating costs, he said, but capital investment decisions must still demonstrate clear value. He pointed out that many suppliers say they deliver efficiencies, but customers need to have these claims proven.

"One of the most significant developments in recent years has been the sector's adoption of digital monitoring and optimisation platforms," said Holland. "These systems enable continuous performance tracking, predictive maintenance and transparent reporting of sustainability metrics."

He concluded that food producers are increasingly looking for technology providers who can work with them to design and apply system solutions that reduce energy consumption without compromising reliability and performance. The industry today looks beyond equipment-specific efficiency ratings to system-wide optimisation that can be tracked and demonstrated.