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In-line gas analysers ensure that packaged meat keeps its appetising colour

When meat and meat products lose their colour on the shelves they appear unattractive to the consumer and are unlikely to be sold: meat discoloration is a significant issue within the packaged food sector.

One key way to inhibit discoloration is to package food in a modified atmosphere with precisely controlled proportions of gases such as oxygen and carbon dioxide. Fresh meat typically requires a high oxygen atmosphere to retain its red colour by keeping the red pigments in the meat stable, while processed meat usually benefits from a low oxygen content to impede the rate of browning by oxidation.

The correct gas mixture is therefore critical during Modified Atmosphere Packaging (MAP). The best and most cost-effective way to ensure that the mixture retains the appropriate proportions of gases is to continuously monitor the gas mixture within the packaging chamber by an in-line gas analyser. The machine measures concentrations of relevant gases in real-time, and if these levels fall outside the acceptable limits the analyser stops the packaging line automatically to allow the source of the problem to be identified and corrected.

“Many plants use manual testing to ensure that the correct gas mixture is in the package,” says Karsten Kejlhof, Sales and Marketing Director for PBI-Dansensor, a leading manufacturer of quality control and assurance equipment for the food industry. “Typically this might involve taking two or three sample packages from the line every 15 minutes and testing the gas composition within the package.”

This approach has two main problems. Firstly, if an anomaly is detected it means that some or all of the packages processed since the previous test will be affected – further testing on these is necessary to locate the point at which the problem arose, or else they all need to be scrapped. “Given that modern packaging machinery can process 100 packs a minute, the previous 15 minutes’ worth of packaging since the last manual gas test could affect up to 1,500 packets,” says Kejlhof.

The second problem is the wastage that arises from the testing process itself. If, for example, three packages are tested every 15 minutes, this equates to nearly 100 packages in a day – or some 2000 packages in a year assuming 200 days of packaging activity.

Continuous monitoring of the gas mixture is, Kejlhof says, a good example of quality assurance. “You are assuring the quality of your process all the time. Manual testing provides quality control – this is important but robust and reliable quality assurance systems need to be in place for the full economic benefit to be achieved, ultimately saving costs. In-line gas analysers represent a key component of a good quality assurance system.”

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