

The process combines air drying and vacuum drying to reduce the drying time from months to just a few hours.

Salami

in HYPERSPACE

Courtesy Metalquimia S.A. and Casademont S.A.



Superfast new European technology opens broad horizons in sausage manufacturing — at a price.

By Michael Fielding, managing editor of technical content

Salami in half an hour. Pepperoni in 25 minutes. The European technology known as accelerated drying process finishes sliced sausage products so fast it sounds like science fiction.

But it's science fact on display at

Spanish meat processor Casademont's 40,000-square-meter main complex in Bonmatí, Spain. The company installed the world's first commercial-scale accelerated drying process for sliced meat products in 2010.

The so-called Quick-Dry Slice (QDS) system, an accelerated drying

process applied immediately after fermentation, dramatically reduces total processing time, improves energy efficiency and allows processors to develop specialized cured products — such as those without salt — that would otherwise be impossible to make through traditional dry curing.

It also allows processors to make more precise adjustments for weight loss and pH, which in turn allows for more control of the appearance, acidity and aroma of the product.

And still, the technology wasn't universally heralded: "At first there was much resistance. Everyone said it was impossible," says President Adriana Casademont, whose 50-year-old company invested \$18 million to update technology throughout the plant and install the first QDS system. In 2004, Casademont partnered with the Center for Food Research and Technology of Catalonia (IRTA) and equipment maker Metalquimia on a pilot project that eventually went full-scale.

REDUCED PROCESS TIME

In a QDS operation, the product is sliced and dried immediately after fermentation, which reduces the total processing time required by conventional drying chambers. A weighing station between two chambers calculates the yield loss halfway into the drying process, and the system adjusts temperature, humidity and air flow in the second drying chamber if required. The trays are weighed continuously, and the system can at any time make minor adjustments to the speed to ensure no variations in the yield.

"All process parameters are recorded minute-by-minute," says Llorenç Freixanet, QDS project manager for supplier Metalquimia.

Both drying time and production capacity vary with the product, though. For example, a salami that is 80 millimeters in diameter requires a drying time of 15 to 30 minutes, producing about 880 pounds per hour. Traditional dry curing requires up to 18 days. Similarly, the process reduces the drying time of pepperoni to 25 minutes from 14 to 18 days.

Bars of fermented product are



Courtesy Metalquimia S.A. and Casademont S.A.

The slices are placed on perforated plastic trays before entering the first dryer. Each tray has an RFID tag that identifies the product without human contact.

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Courtesy: Metalquimia S.A. and Casademont S.A.

The package formation system is variable, depending on the packaging format, the space available and the degree of automation desired.

crusted to 25°F to achieve a consistent slice thickness. After slicing, the trays enter the first drying unit automatically. Once the first, lower level is completely loaded, it ascends, leaving the lower level free to receive new trays. In the second — higher — dryer, the slices are hit with an airflow on the opposite side, and trays travel downward until they reach the same level as the inlet.

Throughout the process, the system's control panel displays variables such as time, temperature and weight loss of each tray in both drying chambers. After leaving the second dryer, the trays are transferred to a conditioning unit where the slices are acclimated to room temperature, a process in which cold air reduces the temperature of the slices.

An overhead robot outfitted with suction cups picks up each slice and

transfers it to another set of conveyor belts before packaging. Meanwhile, conveyors transport the trays to a washing, sanitation and drying tunnel before they are returned to the slicing room to begin the cycle again.

Reduced processing time equals reduced costs. Also, the QDS process allows for a just-in-time workflow, in turn reducing the need for stocking large amounts of product.

ENERGY EFFICIENT

The process uses higher drying temperatures than those used in traditional drying, a change that nevertheless has no effect on the product's organoleptic characteristics, according to Freixanet. In fact, the drying temperature — typically ranging from 68 to 86 degrees F — is limited only by the melting point of

the fat in the product.

QDS relies on fewer conventional refrigeration systems for drying, instead using an innovative air conditioning process that recirculates inside air with atmospheric air and reduces energy consumption by 30 percent compared to traditional drying. Casademont only uses the refrigeration system during the summer months, relying on the recycled air the rest of the year.

Ultimately, the fat content in the product determines the drying time, although it will always be a fraction of the conventional drying time. "What will really affect the drying time is the fat quality and the treatment of the fat during the grinding/mixing process, as this will determine the melting point of the fat," Freixanet explains. "That melting point will limit the drying process

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temperature, which affects the drying time and the energy required to dry the product.”

High water activity typical during traditional dry curing carries with it food safety risks. "Anything can grow in that environment," Freixanet says. "But with the QDS process, the drying time is faster than the growing time of the microorganisms." And since the product is sliced first before drying, rejects can be added back into the next batch, reducing yield loss and the need for additional starter cultures.

QDS has no impact on the shelf life, either, Freixanet says. "The only differences between this system and traditional drying are that the product is less oxidized and the color is brighter and redder in the QDS products," he says.

SPECIALIZED PRODUCTS

"The technology gives us three important foundations for the company: simplicity of the process, flexibility to adapt quickly to markets, and the ability to adjust our formulations almost overnight," Casademont says.

The rapid drying time also opens up options of experimenting with small quantities for niche markets; the short drying time means that formulations may be adjusted very quickly — not the weeks needed for typical research and development.

But, because the fast-drying process does not allow the product to develop the aromas and flavors associated with traditionally fermented products, it often requires formulation adjustments.

Still, processors can more easily regulate the product's appearance, due to better control of both the moisture content and the pH. In a published study by IRTA, Metalquimia and Casademont on the impact of the QDS process compared to the traditional drying process, researchers found that the pH increased slightly to 4.78 from 4.62 compared to a decrease from 5.18 to 4.80 during the long drying of the traditional process. That makes it easier for processors using the QDS system to more accurately control the acidic flavor of the sausage, making for a more consistent final product.

"Your ability to develop new products is multiplied," Freixanet says. "You can create new products every couple days."

Freixanet says that consumer tests have shown that consumers prefer the QDS products, making the system an attractive option for production of RTE products. And as market trends shift

WEB EXTRA

For an exclusive video of the entire Quick-Dry Slice process, visit <http://meatm.ag/quickdry>.

For a closer look at the Casademont facility, visit <http://meatm.ag/qdsplant>.

toward healthier lifestyles, the system is ideal for reduced fat and sodium products.

It also opens the possibility of developing new products, especially those that — until now — have not been possible with traditional curing, such as reduced sodium and low-sodium sausages. Casademont recently launched a sodium-free Spanish-style chorizo sausage.

"Traditional drying is very slow, sometimes eight weeks or more," Casademont says. "Eight weeks is an eternity, and this gives us the same result in 24 hours. The company that is faster and more efficient will survive."

EXPANSION PLANS

Though it exports sausages to 70 countries, Casademont has no facilities outside of the Catalonia region of Spain, limiting the reach of the QDS system. That's all about to change, as Metalquimia plans to install a second system in Europe and one in North America "in the near future," according to Freixanet. He also hints at the possibility of using the system — which is admittedly cost-prohibitive for most processors — on a contract basis, similar to high-pressure processing toll processors, but he declined to offer specifics.

"Great innovations do not depend on the size of a company but the vision, vocation and belief that you really can achieve great things," Casademont adds. "This is definitely the beginning of great opportunity." ☺