

# Putting pressure on poultry

## Processors, including Tyson Foods, are warming up to HPP

By Joel Crews

jcrews@sosland.com

**W**hen Springdale-Ark.-based Tyson Foods Inc. reintroduced its oven-roasted chicken products this past March, many of the new-and-improved attributes of the mainstay product line were realized because of the company's adoption of high-pressure pasteurization technology, which eliminated preservatives and extended shelf life.

The process of denaturing pathogens using up to 87,000 pounds of water pressure as a post-packaging intervention obviously had similar allure to other large poultry processors that took the plunge long before Tyson did. Count the world's largest processor of protein among the list of big-name companies utilizing HPP to add value to poultry offerings; a list that now includes Perdue Farms, Foster Farms, Hormel, Oscar Mayer and others.

"For some reason, ready-to-eat poultry applications have really taken off. There seem to be some real compelling reasons within that segment to pursue HPP," says Rick Marshall, president of Ontario-based Gridpath Solutions, the U.S. agent for HPP equipment produced by NC Hyperbaric, which is based in Madrid, Spain.

Marshall says the recent move among processors to utilize the technology is due to more companies wanting to offer clean labels without sacrificing

food safety or shelf life. "HPP is really the only viable in-package kill step for sliced product," he says. And for firms like Tyson, high-pressure treating its oven-roasted, whole-birds can add enough shelf life to grow the brand for national distribution after years of being relegated as a successful regional line.

With a growing number of processors boarding the HPP bandwagon, suppliers of the technology are in a race to build larger-volume machines and enhance the loading and unloading time of products while maximizing space inside the pressure vessels. Sev-

eral years ago, 300 liter machines were considered ample in terms of size, but today's demand among the processing industry's large companies has led to the development of HPP equipment as large as 420 liters.

In March, when Tyson re-launched its oven-roasted, heat-and-eat products, attributes the company highlighted in re-marketing it included: no preservatives, improved food safety and extended shelf life thanks to "the use of pasteurization," which took its shelf life from 14 days to 45 days. According to Marshall, since adding high pressure



Photos courtesy of Tyson Foods Inc.

pasteurization to the process, demand has been brisk at the company's Evansville, Ind. plant.

"When they first released the product they absolutely couldn't keep up; it was outrageous how much (product) they were pushing through," Marshall says, adding that the plant was HPP treating more than 100,000 pounds of product per day using two, 300 liter NC Hyperbaric high-pressure systems supported by Gridpath Solution's peripheral equipment. "It was running 24 hours a day, seven days a week," he says, including several days when the plant exceeded 130,000 pounds of HPP product per day, which was previously an almost unfathomable volume level.

### Pushing limits

Newer machines are as large as 420 liters and can pasteurize up to 5,000 pounds of product per hour. Besides the ability to hold more product than the previous generation, cycle times of new equipment are also shorter because they are able to rise to pressure faster using more effective pumps. Development of even larger-capacity machines isn't likely. Researchers say the boundaries of physics have just about been pushed to the limit in terms of the size of the pressure vessels. Dwell time of products is also somewhat fixed, as pressure is determined by its water activity (dried products require more time) and what the target organism is, which depends on whether the product is fully cooked or not. The typical dwell time for sliced, RTE meat is fairly fixed at between two and three minutes. However, opportunities to exploit automation in loading and unloading the pressure equipment and drying the treated packages still exist.

The ability to track, audit and monitor products during the HPP process also can be improved, which is an area of emphasis for Gridpath, which partnered with NC Hyperbaric back in 2004 to give the HPP equipment company an international presence outside Europe.

Since then, the company has installed 31 units around the world with plans to add as many as 15 more systems by the end of the year.



As for realizing the benefits of HPP for non-RTE meats, Marshall says there are opportunities for poultry processors to benefit from using the technology on raw products. Pressure-treating raw chicken breasts, for example, can enhance tenderization and improve flavor when a sauce or marinade is added

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to the sealed package and then pressurized. Besides imparting flavor, the added sauce or marinade also serves to mask the discoloration that occurs when raw proteins undergo HPP. "It's a viable application for raw poultry, which can give you a 45 to 60 day shelf life for raw product," he says, "but I wouldn't call that a mainstream application yet."

### Entrepreneurial appeal?

As HPP has become more mainstream for sliced, RTE meats, most processors are aware of how the technology works and inquiries to companies supplying the technology tend to be less focused on whether or not it is an effective intervention and more about how the equipment and process can be implemented into their plants. "You don't have to explain the technology anymore," says Marshall.

As for the frequency of inquiries among industry-leading companies, there is no shortage of tire kicking going on when it comes to HPP. "There is absolutely nobody, it seems, in the entire industry that hasn't investigated it at some point," whether running trials or doing in-depth investigation on the investment, which runs anywhere from about \$700,000 for the smaller vessels to \$3 million for the largest size.

With the more recent improvements implemented, HPP per-pound cost when using the larger vessels with faster cycle times range from about 5 cents to as low as about 3 cents. Thanks to more equipment being on the market, processors now can accurately estimate the cost of operating and maintaining HPP systems after the investment in the equipment is made. This is especially important to small and medium-size processors, a segment NC continues targeting by marketing its smaller units to those operators. "We are focusing on making this technology accessible for the whole market, not just the big players.

"It's critically important that as a supplier, we don't lose track of the importance of the smaller machines. The expansion of the market due to the capacities of the big machines makes them attractive to the big companies, which sets the benchmark the smaller companies must follow if they want to maintain a certain level of differentiation and keep the playing field level." **M&P**

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